DOMESTIC ENGINEERING

Whole No. 905. Vol. LI. No. 3. 325 Dearborn St., Chicago. April 16, 1910

CONTENTS.

Risks and Liabilities. Are you Protected?..... 51
"There is Sewer-Gas"..... 53
"Jes' Thinkin'"..... 53
Personal Mention..... 53
A Side-Hill Heating Job..... 54
A Practical Manual of Steam and Hot-Water Heating 55
The Costs of the Plumbing Business..... 57
Government Contracts to Be Awarded..... 60
Contracts Awarded..... 60
Convention Dates..... 61
Business Management..... 62
Where Should He Go?..... 62
Should Work Ever Be Taken at a Loss?..... 63
Which is the Better Trade to Learn?..... 63
Many "Easy Sellers"..... 63
Some Noteworthy Features of the Plumbing in the Secor Hotel at Toledo, Ohio..... 64
News from Maine and Rhode Island..... 65
Questions and Answers..... 66
Question About Hot Water Supply Job..... 66
Professional Men Responsible for Washington Plumbing Code..... 66
How Many Feet of Radiation on a Range-Boiler?.. 66
Suggests Cure for Reversing Coil..... 67
Where Would You Locate the Sink?..... 67
The Augusta Steam Job Which Failed..... 68
Advantages of Having Air-Lines on Steam Radiators, either with or without Vacuum Pumps..... 69
Among the Wholesalers..... 70
National Ventilating Co. Sells its Plant..... 70
Chances for Pacific Coast Representation..... 70
Iron City Sanitary Manufacturing Co. Moves Its Headquarters..... 70
The April Meeting of the Illinois Chapter..... 70
Illinois Malleable Iron Co. Completes Large Addition..... 70
Plan to Buy two Potteries..... 70
Brisk Demand for Exhibit Space at Chicago Convention of the N. A. M. P..... 70
The Iron Market..... 71
Pig Iron Stagnant..... 71
The Copper Market..... 71
The Market in Pig Lead..... 71
The Spelter Market..... 71
The Pig Tin Situation..... 71
The Old Iron Market..... 71
News from Wisconsin..... 71
Pacific Coast Letter..... 72
Ohio Plumbing Inspection Bill Passes House of Representatives..... 56
Obituary..... 56
New Business Ventures..... 57
Good Books to Read..... 57
Classified Advertisements..... 58
Index to Advertisers..... 60

RISKS AND LIABILITIES.

Are You Protected?

Theoretically there should be no risks. Actually, we cannot take one step in life without an accompanying risk. In spite of this well-known fact, it is surprising to know the apathetic condition of minds in this regard. Apathy alone can explain the so far laggard response to the advantageous liability-insurance protection offered to plumbers through the efforts of their national association. After a campaign of two months, only 109 policies have been taken out, and yet the number of men reached by personal contact with them at the different conventions must have been nearly 2,000. All of these men endorsed the policy by approving of the resolution presented to their association concerning it. Acknowledging its worth, they are still satisfied to take the risks.

The risks of life are peculiar. They can be classified as regular and irregular. The irregular ones seem to concentrate their forces upon the most careful persons. **Unless one is protected in a definite manner, how can one escape from the results of such risks as are presented below?** We simply publish herewith a few of the irregular and regular risks of the business in the hope that their reading will stimulate those of our readers to instantaneous action for self-protection.

Accidents to Employees.

A plumber had a store on a main street and a workshop at the back of the store, separated from the main building by 15 feet of court. A special job of fitting necessitated the removal of some material from the back of the store to the work-shop across the court. Close to the door, and obstructing somewhat the path of the material, was an old cask which had contained shellac. It had been emptied and was resting, bung-hole down, close to the side of the building. A journeyman plumber was assigned the work of clearing the court. He commenced to roll the barrel away, with his pipe in his

mouth, and as the bung-hole came uppermost, a spark from the pipe fell into the hole and the cask exploded, setting fire to the rear shop and severely burning the man about the face and the hands. To bring about this accident, several factors were necessary. Its contents had to be of such a nature as to give off inflammable gases; the cask had to be turned bung-side down and the hole sealed to retain those gases; the time had to be sufficient to make the quantity of gases dangerous; the position of the barrel and the speed of rotation had to be such that the dropping of the spark from the pipe should occur at the precise moment that the hole in the cask was in line with its fall.

We mentioned in our last issue, but it is worth repeating, a case of a member of a local association, who deferred taking advantage of the present policy till active business with its accompanying regular risks, would justify him in doing so. What happened? Along came an irregular risk to show him his error. He assigned one of his men the work of opening up a barrel of asphalt. The barrel exploded, the man was hurt, and the plumber was out $500. Had he been insured at the small cost of $0.75 for $100 worth of payroll, he would have been amply protected.

Supposing one of your mechanics, proceeding from one part of the building to another should fall through the floor and be injured or killed———.

Supposing some boards, serving as a floor for some of your men, broke and then the men were injured, permanently disabled or killed ———.

Supposing, in the fitting up of pipe one journeyman should drop a piece of the material on the man below, with resultant injury or loss of life———.

Supposing serious accidents should occur as a result of the following common causes:

From breaking of planks or scaffolding.

From falling derricks or breaking of parts of same while hoisting machinery.

From caving-in of ditches or trenches while making house or building connections with main sewer or water-system.

Accidents in ditches or trenches from material falling upon employees or breaking of machinery or derricks while material is being hoisted.

Accidents in the shop from breaking of belts, machinery, pulleys and shaftings, etc.

From accidents in the shop resulting from the operation of stamping presses or other machines where fingers or hands are taken off.

Accidents in the shop from explosion of boilers, etc.

Indeed the many causes of accidents are practically infinite in their number and it would be almost useless to enumerate more that would come in the class where the employee is concerned, and where the master plumber is protected in every particular by the policy being issued by the Casualty Company of America.

How are you protected in your responsibility to the public? You can get into difficulty at any moment as shown in the following synopsis of public risks which are of daily occurrence.

Injuries received by employees of other contractors working in the building from material dropped by employees of the plumber; accidents to persons passing on the street from the same cause.

Accidents to persons falling in to unprotected ditches or trenches left unguarded by employees, or driving into ditches or trenches left unlighted by employees of the plumber, or by driving into material left unprotected or unguarded on the public highways.

Accidents to persons passing by on the street resulting from heating, lighting or ventilating machinery or equipment hoisted in the building, or loaded or unloaded from vehicles.

Accidents to persons passing by on the street from planks, guy-ropes or wires, skids and other appliances used in connection with hoisting machinery or equipment.

Supposing Any of These Liabilities to Attach to You How Are You Protected?

There is no such thing as "absolute immunity" from accident. There are too many chances against us and non-protection by proper insurance is simply adding to the list. The ordinary man is subjected to extraordinary risks, even in his simple relationships of life. The business man, whose industrial relations are far more complex, incurs ultra extraordinary risks. Precautions most carefully taken against one evil seem simply to lead us into the clutches of another. **Hence, we are not only insuring against the evils that we know not of, but also against the evils into which we are led by our precautions against other evils.**

We have made for some time past, a record of special happenings bearing on this subject. In the month of July last year, we note two of more than ordinary interest.

A young man going through a wood along a narrow path, found a stump of tree almost blocking the path in the center. A jagged portion of the stump induced him to choose the passage on one side of the tree rather than the other. A rattlesnake was concealed in the side of the stump that he chose as his route. He was bitten by it and died. In trying to save his clothes, he lost his life though he took the normal course. His precaution was of no avail.

The parents of a boy in St. Louis determined that their only boy of 12 should not be subjected to the risks of danger from fireworks in that city

on July 4th. They sent him across the river to stay on the farm of a friend at Belleville. The boy sat by the river, fishing, with his back against a tree. A neighboring country boy chose that particular tree to set off the only giant cracker he possessed. The explosion caused the St. Louis boy to lose his balance; he fell into the river and was drowned. Precautions were taken, but were unavailing.

The presentation of these few out of many instances ought to convince the most doubting Thomas. We invite our readers to study carefully the advantageous terms in the policy published in full in our last issue. Speaking to Mr. Donovan, in a recent interview, he said that so far his preaching seemed to have been like that of John the Baptist in the wilderness. We assured him, however, that as soon as the association officers had spread the glad tidings throughout their respective territories, that we felt confident that the members of the profession as business men, would show their appreciation of the offer by a liberal response. We will be pleased to answer any inquiries on the new policy, should any particular questions arise in the mind of the readers.

"THERE IS SEWER-GAS!"

Editor "Domestic Engineering":—What is "Phoenix" trying to prove by his argument that sewer-air is like "Winslow's Soothing Syrup," perfectly harmless and not unpleasant to the taste." "Domestic Engineering" is a plumbers' journal. Plumbers advocate the installation of systems of plumbing designed to keep sewer-air out of buildings occupied by human beings on the theory that any expense necessary to accomplish this is justifiable because sewer-air is dangerous to health. Now comes a regular contributor to the trade paper and argues that sewer-air is positively healthy, that men whose days are spent in public sewers live longer than those unfortunate beings who have to walk our streets, and live in our houses. For my part, I would prefer a short life, and a merry one. Give me the deadly air that blows over the pavements, which one can breathe without holding one's nose for the few short years that one can stand it, rather than a century of life on a daily allowance of pure sewer-air.

"Phoenix" wastes a lot of valuable space to prove that sewer-air is not sewer-gas. Long usage of any term justifies its use, and of the two sewer-gas is more correct. Pure air has certain known constituent parts. When other volatiles are mixed with it, it may properly be called sewer-gas; and sewer-air may be, and no doubt frequently is, properly a gas. Two instances from my own personal observation might help "Phoenix" to understand why we believe there is such a thing as sewer-gas and that it is dangerous.

A digger employed in opening a private sewer, which had become stopped, was overcome when he cut into the sewer, and died three days after. The doctor said it was poisoning of the system by sewer-gas.

A man employed in a factory was using the toilet-room, which was a range of unventilated closets, when he struck a match. An explosion followed, and the wooden partition caught fire. It was found that there was a leak from a gas-machine 400 yd. away and the gas had gotten into the sewer. Was that sewer-gas? I believe "Phoenix" would be better employed were he to devote his energies to discovering how better to keep sewer-gas or air out of our houses than to try to prove that it is good for us.

Billings, Mont. R. Sherwood.

"JES' THINKIN'."

Editor "Domestic Engineering":—"Jes' Thinkin'" perhaps I ought to give you an answer to your editorial in March 12th issue relative to association work, which is a good cause, and I would not have you think for one moment that I am opposed to it, for without it the plumbing craft would be in a worse condition than it is now.

I have noted with interest, for the past few weeks, the different ideas on the simplicity of plumbing in your valuable paper, and I have given it lots of thought and study lately. I wish to say a few words in reference to sewer-traps, of which there are some that should never be used for that purpose at all, and I will try to prove this.

First, I contend that the best and only trap to be used on either sewer or cesspool is the double-vent intercepting trap, for the simple reason that it is vented on either side of water seal and gives a free circulation of air throughout the soil-pipe line, as well as to sewer or cesspool. The running "S" or "P" trap, which is only single-vented, gives only ventilation to soil-pipe line and not to sewer or cesspool. The foul air from the sewer or cesspool will thus affect the water-seal in the latter trap, because sewers and cesspools, as a rule, are covered so that there is no chance for this foul air to escape and the foul odor from this water-seal will therefore be driven back through the soil-pipe line, and if there are any poor traps on the plumbing fixtures, a lot of foul air will escape into the house. With the double-vent intercepting trap these conditions do not exist, for there is fresh air passing over both sides of this water seal at all times. If the soil-pipe lines are installed right, there will be no danger of foul air escaping into the house for the line has free access of fresh air at all times. I am speaking from experience, as I have tested both traps and know that the intercepting trap is right at all times.

Lebanon, Pa. James W. Bohr.

PERSONAL MENTION.

John Clifford, secretary of the L. Wolff Mfg. Co., has returned to Chicago from an extensive trip in Florida, on which he was accompanied by his daughter.

H. E. Adams, assistant treasurer of the American Radiator Co., Chicago, who has been confined to the hospital for some time, is on the road to recovery and expects to leave soon for a short stay at Excelsior Springs, Mo., in order to regain his usual good health.

J. J. McGuire, one of the leading master plumbers of Minneapolis, Minn., has just returned from a trip to Seattle, Wash., where he had a most pleasant visit with D. B. Spellman, one of that city's best known master plumbers. Mr. Spellman showed Mr. McGuire Seattle's large enterprises and business projects and he was most favorably impressed with what he saw. The two plumbers are tried and true friends from way back in the eighties, when Mr. Spellman was in Mr. McGuire's employ.

Joseph A. Weldon, one of the most prominent master plumbers in western Pennsylvania, and a well known business man of Pittsburgh, Pa., has been named as a member of a committee of seven by Mayor William A. Magee, which forms a Commission which will revise the building ordinances of the city. Those associated with Mr. Weldon in this work are: Edward E. Stotz, architect; F. A. Russell, architect; W. G. Wilkins, engineer; D. P. Black, real estate man; W. S. McDowell, lawyer, and S. N. Murphy, building contractor.

A Side-Hill Heating Job

By Phoenix.

In a hill-side city, which is something of a railroad center, there is a 3-story residence which is heated by a combined steam and hot-water plant, the source of heat coming in each instance from the same boiler.

Many people had figured on heating this house but they were afraid to take the job when it came to a real "show-down" and all sorts of fool contraptions were suggested, when merely a self-acting and simple plant was all that was desired.

Finally a party came along who had rather an inquisitive turn of mind and he made a bid and landed what the other contractors said would be his "white elephant." While such jobs have, in later years been occasionally done, they are not such common installations and I am going to describe the particular features of this job at some length.

The residence was located upon a steep hill-side and the kitchen, one bed-room, the dining room and cellar constituted the first story.

The other rooms were located in the two stories above.

The problem was to heat the bed-room and dining room from the steam boiler which was located on the same floor level in the cellar back of these aforementioned rooms.

No steam traps or traps could be used because the main care of the boiler came under the charge of the lady of the house. It was a cinch to heat the second and third stories by steam for the basement was some 10 ft. deep and there was plenty of room for fall. So these two were heated after the usual manner by a low-pressure gravity-return system, which left the top of the boiler at 6 in the drawing given.

The contractor therefore decided to try and heat the dining room and bed-room (on same level of boiler) by hot water; at the same time he made the boiler carry half-a-pound pressure of steam in heating the two upper stories. So with a hand-drill, he tapped a 1¼-in. hole in one of the sections of the boiler at the most convenient side and at a point some 12 in. below the lowest level the water-line could ever assume, and still "show-up."

Now hot-water heating is a somewhat different proposition from steam, as many a fitter will own, even in this more enlightened age and no one yet knows it all. For the benefit of the reader, I am going to state that the first attempt of this combination-job was a failure.

Two radiators were used and they were connected after the fashion of the radiator shown by 1, 4, and 5 in the illustration.

These two radiators heated up somewhat, but never at any time were all the loops thoroughly hot, though they were not air-bound, as air-valves were used.

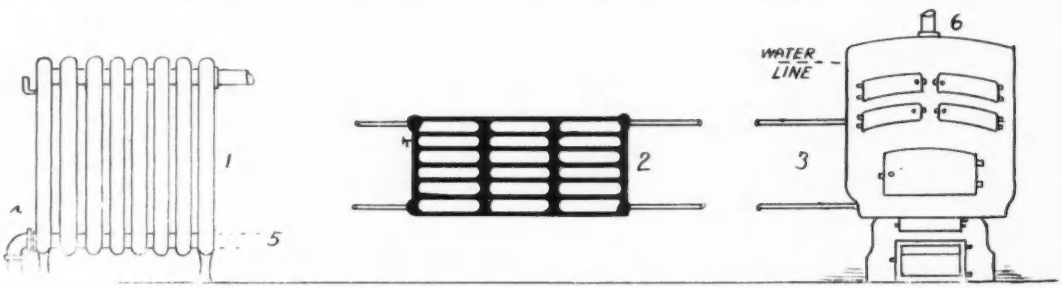
The two radiators were connected in an improper manner, the return being taken in each case as shown at 4. Had it been taken from point 5 (shown by the dotted lines,) all would have been well.

However, the water was drawn from the boiler and wall radiation supplied as shown at 2 and both radiators placed upon a continuous line. There were more than two sections used. I have merely given the typical connection.

After this wall-radiation had been connected in the manner shown, water was again let into the boiler and the job fired up. A fine circulation was obtained in the radiators which were heated by the hot-water below the boiler's water-line and the amount of steam necessary to heat the rest of the house seldom equalled half-a-pound pressure.

The return from the hot-water branch of the job was run into the back of the boiler in the same manner as it would be done in any ordinary job as shown at 3. The supply and return pipes to the hot-water radiators were not covered, but merely bronzed, the heat being desired to assist in warming the two rooms.

No shut-off valves were used upon these two radiators as it was not necessary to cut off the heat at any time during the heating season.



Sketch Showing Unsuccessful Radiator Connection, also wall radiator and how Heat was secured from Hot-Water Boiler.

This was a large house and as previously stated located upon a side-hill. It was exposed to strong north and west winds and the temperature frequently went down to 20 deg. below zero.

About 500 ft. of radiation, figuring in both the steam and hot water, was made use of to warm the house and there never was a day, the owner stated, but what he could easily get the house up to 72 deg. without "fretting" any. The amount of hard coal burned each season in this job to bring about the heat desired by the owner, (who likes to have "a house where he can sit in his shirt-sleeves") varies somewhat with the severity of the winter season in that locality.

Some years he has burned 10 tons of coal and others he has put 12 tons through the boiler. He says "you can put all the coal into the door that you care to shovel through" and I guess he is right for he claims that he can run the boiler on from one to two tons less fuel than any other member of his household. He burns egg-size coal, banked with pea-coal and the fire-box is generally as black as the ace of spades. No "forced draft" and roaring fire in "his'n."

A PRACTICAL MANUAL OF STEAM & HOT-WATER HEATING

BY EDWARD RICHMOND PIERCE

SECTION II

Having found a clear flue which in its smallest part is equal to, or exceeds in the area required by the boiler it is intended to use as indicated by the smoke-collar on the boiler, the next thing is to look for possible objections to the proposed flue, either at the top or the bottom. Figs. 3, 4 and 5.

See if the chimney-top is lower than any projecting portion of the building, or even on a level with it; if any nearby building towers above it; if trees grow so as to

Fig. 3.

obstruct the draft when the wind is from certain directions. If everything outside is unobjectionable, look at the bottom of the chimney-flue, and make sure provision is made so that the bottom of the flue ends

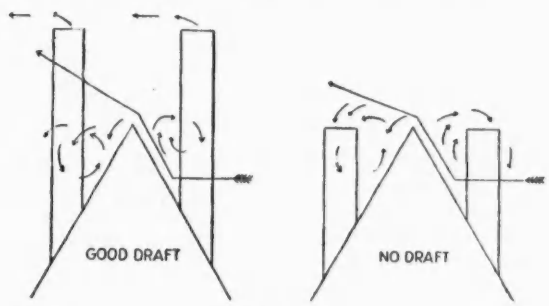


Fig. 4.

not more than 18 or 20 in. below the point where you intend to make the smoke-pipe connection. A good practice is to have a close-fitting slide-damper placed as many inches below the bottom of the smoke-pipe as the pipe is inches in diameter, and below this can be placed a clean-out door if the owner desires; but there should be no openings below the smoke-pipe opening. Next look for fire-place or stove-pipe openings into the chimney-flue above the smoke-pipe to the boiler-opening. If any are found they must be closed and sealed tight and in such a manner as to leave the chimney-flue smooth on the inside if possible. Lastly, make sure that the capstone of the chimney has opening sufficient for the required area.

Owners often put on capstones with two or more openings, the combined area of which may be from 25 to 40 per cent only of the area of the chimney proper.

It is a very common experience to find an 8x12-in. chimney capped with a stone with two holes in it, each 5x6 in.; this at once reduces the delivery-area of the chimney from 96 sq. in. to 60 sq. in. Occasionally an 8x12-in. chimney will have a cap with two 4x6-in. holes, thereby cutting the delivery-area of the chimney down to 48 sq. in., or, of no more value than a 6x8-in. free area.

It should be remembered that a new chimney which has a large amount of moisture and which quickly absorbs a lot of heat from ascending gases will not have as vigorous a draft as when it is thoroughly dried out. On the other hand, do not assume that because a given flue has served for a hot-air furnace that it will answer for a steam or hot-water job to heat the same house. The conditions required for the operation of a steam-boiler, or a hot-water boiler, successfully may be very different from that required by the hot-air furnace.

The hot-air furnace may not have supplied warmth at one time to more than half the number of cubic feet of air that the steam or hot-water boiler is expected to heat all the time.

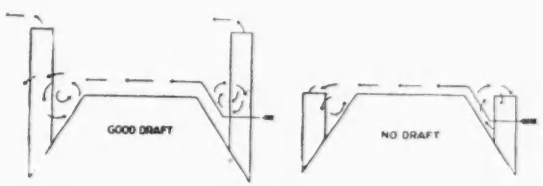


Fig. 5.

Table A gives the areas of circles—From this table it is easy to determine the free area in square inches a given boiler will require. For instance, a boiler which is cataloged to require a 10-in. smoke-pipe would require a chimney-area of not less than 78½ sq. in. and it is usual to use with such a boiler an 8x12-in. chimney-pipe, or a 10-in. round flue if the chimney is 45 ft. to 60 ft. high and a 12-in. round flue if the chimney is 20 or 30 ft. high. Boiler-manufacturers do not all use the same size smoke-flue on their boilers for the same rated capacity in square feet of radiation; therefore, no exact rule for chimney-size per hundred feet of radiation can be given, but, in a general way Table B will be found sufficiently accurate.

When using Table A for ascertaining the chimney-area required, always select the area next larger in square-edged flues, unless the exact size is found. For example, if a boiler has a 9-in. smoke-pipe, Table A shows a 9-in.

circle has an area of 63.6 sq. in., and you note an 8x8-in. chimney-flue has 64 sq. in. It would evidently not do to use an 8x8-in. flue, because in order to do it, you must reduce the manufacturer's required area for the proper working of his boiler from 9 to 8 in., or from 63.6 sq. in. to 50¼ sq. in! This means that the boiler as designed, has at this vital point been choked over 26 per cent—and it is certain that no machine, rated to do certain work when all its component parts are perfect, can reasonably be expected to do the same work, and equally well, when over 25 per cent. of any one of its vital points of construction is taken away.

TABLE A.

Areas of Circles.

Size	Area	Size	Area	Size	Area	Size	Area
⅛	0.0123	10	78.54	30	706.86	65	3318.3
¼	0.0491	½	86.59	31	754.76	66	3421.2
⅜	0.1104	11	95.03	32	804.24	67	3525.6
½	0.1963	½	103.86	33	855.30	68	3631.6
⅝	0.3067	12	113.09	34	907.92	69	3739.2
¾	0.4417	½	122.71	35	962.11	70	3848.4
⅞	0.6013	13	132.73	36	1017.8	71	3959.2
1	0.7854	½	143.13	37	1075.2	72	4071.5
⅛	0.9940	14	153.93	38	1134.1	73	4185.3
¼	1.227	½	165.13	39	1194.5	74	4300.8
⅜	1.484	15	176.71	40	1256.6	75	4417.8
½	1.767	½	188.69	41	1320.2	76	4536.4
⅝	2.073	16	201.06	42	1385.4	77	4656.0
¾	2.405	½	213.82	43	1452.2	78	4778.3
⅞	2.761	17	226.98	44	1520.5	79	4901.6
2	3.141	½	240.52	45	1590.4	80	5026.5
⅛	3.976	18	254.46	46	1661.9	81	5153.0
½	4.908	½	268.80	47	1734.9	82	5281.0
⅛	5.939	19	283.52	48	1809.5	83	5410.6
3	7.068	½	298.64	49	1885.7	84	5541.7
¼	8.295	20	314.16	50	1963.5	85	5674.5
½	9.621	½	330.06	51	2042.8	86	5808.8
¾	11.044	21	346.36	52	2123.7	87	5944.6
4	12.566	½	363.05	53	2206.1	88	6082.1
½	15.904	22	380.13	54	2290.2	89	6221.1
5	19.635	½	397.60	55	2375.8	90	6361.7
½	23.758	23	415.47	56	2463.0	91	6503.8
6	28.274	½	433.73	57	2551.7	92	6647.6
½	33.183	24	452.39	58	2642.0	93	6792.9
7	38.484	½	471.43	59	2733.9	94	6939.7
½	44.178	25	490.87	60	2827.4	95	7088.2
8	50.265	26	530.93	61	2922.4	96	7238.2
½	56.745	27	572.55	62	3019.0	97	7389.8
9	63.617	28	615.75	63	3117.2	98	7542.9
½	70.882	29	660.52	64	3216.9	99	7697.7

To find the circumference of a circle when diameter is given, multiply the given diameter by 3.1416.

To find the diameter of a circle when circumference is given, multiply the given circumference by .31831.

TABLE B.

Approximate sizes of Chimney-Flues for Steam and Hot-Water Heating in Residences and other Buildings.

DIRECT RADIATION *		SIZE OF FLUE	
Steam in Square Feet	Water in Square Feet	Round	Square
250	400	8	8 x 8
300	500	8	8 x 8
400	700	8	8 x 8
500	850	10	8 x 12
600	1000	10	8 x 12
700	1200	10	8 x 12
800	1350	12	12 x 12
900	1500	12	12 x 12
1000	1700	12	12 x 12
1200	2100	12	12 x 12
1400	2400	14	12 x 16
1600	2700	14	12 x 16
1800	3000	14	12 x 16
2000	3400	14	12 x 16
2200	3700	16	16 x 16
3000	5100	16	16 x 16
3500	5900	18	16 x 20
5000	8500	18	16 x 20

* NOTE—When a considerable amount of INDIRECT radiation is to be used, increased Boiler capacity is necessary and in many cases such demands require a larger chimney flue for same number of square feet of radiation used.

To Determine Amount of Heat-Loss From Rooms in Buildings—Measurements.

This question of the proper "figuring for radiation" is not an easy one to solve and the task is not made easier when the solution is to be attempted without resorting to algebra.

As a matter of fact there is no "hard and fast rule" applicable without change or modification to each and every condition.

The mere fact that two rooms are 15 ft. square and 10 ft. high, with a cubic content of 2250 cu. ft. each, does not determine that there will be the same amount of heat required in each to maintain 70 deg. in each room when it is zero outside. If it did, the task of estimating the required amount of radiator-surface would be simple.

It requires no argument, or illustration, to demonstrate that if a given room shows a temperature of 70 deg. at one time of the day, and zero at another hour, that there has been a loss of 70 deg. of heat. It is also evident that if the doors, windows, or other openings have been tightly closed between the period when the room was at 70 deg. until it reached zero, that the heat must have in some way, passed through either walls, floors, ceiling or doors and windows, or, that each of them had contributed its proportion of the loss.

This much granted, the next step is to determine how much of the total loss each factor has contributed. Unless this can be determined with considerable exactness it would be the rankest sort of guesswork to attempt to "figure" for radiator-surface.

Fortunately, science and experiment have determined with considerable exactness the number of units of heat which a square foot of window-glass will permit to pass through it in a given length of time if one side of it is at 70 deg. F., and the other side has a temperature of zero. All the other factors, walls, doors, floors, ceilings—are found to be contributors to the total loss, each in its own proportion. As heat never passes from a cooler body to a warmer one, it follows that the colder the surrounding or connecting body the greater will be the loss in a given time from the warmer. Therefore not a single factor which goes to create the room will lose the same amount of heat under all conditions. Again it is not necessary to illustrate by argument that a brick wall 9 or 10 in. thick will not lose as much heat through a square foot of its surface under varying temperatures as would be lost through a square foot of window-glass.

The point to find out is how much of the total loss, each hour, does each factor furnish, and having found this, the next step will be, how to so arrange the heating surface that it shall balance the hourly loss from all sources and thereby maintain the room at a steady temperature.

It would not seem necessary to advance an argument to demonstrate that a rule, for the proper proportioning of heating surface in a room whose total loss of heat was created by losses through various factors, could only be made by carefully ascertaining the amount lost by each factor, and when this had been found that the proper rule for supplying this loss from a heated body would depend entirely upon the temperature of the heated body.

(To be continued.)

The Costs of the Plumbing Business*

By S. H. Morgan, Detroit, Mich.

A great deal has been said and written in the past and even now is being repeated about the master plumber being a robber or other words to that effect, and not without some grounds for truthfulness of the assertions. At the same time it can as truthfully be said that the master plumber as a rule is not successful in the accumulation of this world's goods. How can we harmonize these assertions? Can they both be true? I shall endeavor to show you that such is the case, but not from the point of view taken by the public, and to state from my experience wherein the trouble lies. I will also endeavor to point out a way of escape from both of these claims.

In the first place we are all guilty in a greater or lesser degree of the sin of undercharging, which is responsible for the financial condition of our business, and we have earned the sobriquet of "robber" by taking undue advantage at times of confidence placed in us by our friends, who have allowed us do to work for them without first naming a price for which we would do the work. Or, if a schedule or percentage price was named, by charging a greater number of hours or a greater quantity of materials than had been furnished, or both. I claim that either of the above methods of doing business is wrong; the first, a sin against yourself, and the other, a sin against not only the customer but those of our craft as well who are not willing to stoop to such methods, because the public does not discriminate and lays the charge against all the craft.

Are you in either or both of these classes?

The spirit of modernization has taken a strong grip on the plumbing situation. It is demanded that the plumber give his customer the most modern there is to be obtained in plumbing installation, practice and fixtures, and it is not only fair but necessary that the plumber be modern with himself.

Somewhere we have read the words "Know Thyself". Similarly it could be said "Know Thy Business", and it is part of the make-up of every successful business man to know always the exact and true condition of his business.

This brings us to the point where we may examine into the conditions surrounding the plumbing business, and the men engaged in it, and, I believe, ascertain definitely what is the largest factor entering into the lack of financial success of the men so engaged.

The average man contemplating to engage in business is one who has served an apprenticeship and advanced to a journeyman, one who is either a poor mechanic unable to hold a steady position, or is a good mechanic who has worked hard and saved up a few dollars. In the first case he goes into business because it seemed the only chance left for him which will enable him to make a living for his family. In the other case he desires to better his condition and thinks he can make more money by working with the tools.

Whatever the incentive maybe it is very rare that a man engages in the plumbing business who has had the advantage of any business training, and almost invariably has very little education, the majority not even having gone through the grammar grades of our public schools. He may understand the principles involved and be proficient in the practice of installation of plumbing equipment but that does not by any means equip him as a business man. He knows nothing of the science of accounts or of the methods necessary to be used in order to conduct a successful business.

The records of our country show that only about one in a hundred who engage in business generally, ever make a success of it and it must be conceded, a large percentage of the men in business, generally in all lines, are educated and experienced.

What chance then, think you, has the average plumber of success. I should say not over one in a thousand and if you will look the field over you will agree with me that such is probably a fair proposition.

How many in this room or in the state who have been in business for any considerable length of time can show an accumulation of as small a sum as one thousand dollars per year, direct from their plumbing business, for each year they have been in the business and yet look about at men in other lines and this is not so. What is the matter? Where is the trouble?

The average master plumber runs his business in a haphazard and slipshod manner; he knows very little or nothing of what it costs him to do business. He does not take into account when figuring on a contract the percentage of his operating expenses, that such contracts must carry, but blindly estimates the cost of labor and materials, adds to this a paltry percentage which he is pleased to call profit and takes the contract believing he is going to make some money out of it, when as a matter of fact had he known what it cost him to do business he would have known that the price was below cost. In addition and even worse than this he many times lacks methods in arriving at the cost of the labor and materials and does not include all the material required upon the job, makes a mistake in counting the number of fixtures, misses an entire bath-room, leaves out the gas-fitting or makes any one of a thousand other errors possible and even probable.

How many contractors make a careful estimate of the pounds of caulking lead required, or the quantity of oakum needed? Almost invariably such items as gasoline, candles, screws, etc., are omitted from the estimate and yet they are needed and cost money.

In Detroit we have a printed estimate sheet, with headings, covering practically all the items necessary to be used in an ordinary plumbing installation and with blank spaces for description of special fixtures, and other items entering into the cost.

A man using the sheet will draw off his materials in the same routine on every job and should check over the unused headings besides going over the plan and specification carefully a second time to guard against errors.

After the materials are all drawn off and priced he must estimate his labor, which is a very difficult thing to do with accuracy and here we cannot help him except to suggest he estimate the time required on each part of the job separately, based on the wages paid, and the amount of work he can get done for a day's pay, using his experience on previous work as a guide.

We will now admit he has allowed a fair amount as the

*Address delivered at the recent annual convention of the Michigan State Association of Master Plumbers, at Jackson, Mich., accompanied by demonstrations on a blackboard.

estimated cost of labor and materials, but is this the cost of his completed contract? It is not, and he has yet to encounter one of the most serious problems which enter into the conduct of the business, viz. the cost of operation and its relation to the contract.

With only an **estimate** of the cost of labor and materials and no idea of operating expenses he puts on so small a percentage to cover expenses and profit that in many cases the replacing of a single defective fixture wipes out the entire margin, to say nothing of the many other losses which may, and quite often do occur, which were not figured on. Is it any wonder he is not getting rich? Nay, on the contrary it is a marvel how he continues in business as long as he does, and this is largely explained by his being guilty of the first sin alluded to in my paper. The jobbing end of the business is done on an entirely different basis and while some of our members are guilty, no doubt, of overcharging on this work, I believe it almost an impossibility, but it is from the results of this work largely that we receive the uncouth name before referred to. But what are the facts: The majority of this work is on small jobs, many of them at a considerable distance from our place of business, and they are wanted done in a hurry, and very seldom do our customers give us sufficient information about the nature of the work to be done. Very often the trouble observed by our customers is only the result of the actual difficulty and it necessitates the loss of much time unnecessarily, in making repairs, but this is not the fault of the master plumber, although the customer usually claims it is. It is almost invariably the conditions surrounding repair work that cause the bill which follows to seem unreasonably high. It is usually this class of work that calls forth the unjust complaints about prices.

It must be conceded by all that the jobbing part of the business does bring to the master plumber a greater margin of profit than his contract work and very often this part of his business balances the losses from his contract work and enables him to remain in the business which should produce a living profit if we expect to succeed.

There are comparatively few master plumbers who have adopted accurate book-keeping methods, consequently there are but few who know what their expenses are and what relation or percentage such expense bears to their total volume of sales. It is absolutely necessary that a man should know this in order to make an accurate estimate on the cost of installation of plumbing work.

We took this matter up in Detroit a few weeks ago in an effort to do some work along educational lines and with a view to getting our members interested. It was about the first of the year and we wanted to get them to put their bookkeeping on a systematic basis and to enable them to figure out for themselves from their own books why they had not made money. This resulted in finding that quite a number of our members had operating expenses averaging approximately 20 per cent. of their sales. It was found necessary with some of our members to make an explanation as to what was meant by percentage and to show them how to figure percentages. We found also that very few were keeping accurate account of their expenses, some had one expense account to which they charged not only the expense items but the labor as well, while others charged expense items to merchandise, and in various ways handled their accounts so that no correct idea of their operating expenses could be ascertained without having an expert go over their business for the year and straighten the items out. I do not believe master plumbers in Detroit are much different from those in other parts of the country so would expect to find about the same conditions elsewhere.

I advocate the keeping of a set of books with separate accounts for the different expense items, although they may be grouped in any manner you wish, so long as they are entirely separated from the other accounts on the ledger. Below you will find a list of the items necessary in the conduct of the plumbing business:

Salary	$1,300.00
Rent	240.00
Light	18.00
Heat	30.00
Telephone	72.00
Horse & Wagon	200.00
Bookkeeper	516.00
Insurance	25.00
Taxes	30.00
Cartage	50.00
Car-fares	100.00
Tools	100.00
Collections	125.00
Bad Accounts	100.00
Driver	450.00
Waste Materials	125.00
Replacing Defective Goods	50.00
Labor Lost	150.00
Allowances	75.00
Int. on Capital 3% on $4,000	120.00
Postage	25.00
Stationery & Printing	40.00
Association Dues	24.00
	$3,965.00

In making this list of expense items I have covered such expenses as we in Detroit find upon our books and the amounts set opposite each item were arrived at by consultation with a number of men. They are not expected to appear accurate to the critic, but I am sure will represent in the aggregate a fair estimate of the cost of carrying on a plumbing business in a city like Detroit, where the business represents a volume of say $20,000.

The item of salary is one not to be overlooked and is what we pay a journeyman, or in other words what the master plumber would have earned had he been still carrying the kit as a journeyman. Rent, light and heat are all necessary items; the item for telephone will vary in many localities. The charge of two hundred dollars for a horse covers its feed and care, also the wear and tear on harness and wagon and the depreciation on the horse itself. The amount included for bookkeeper is too low if you expect very efficient service and I would not recommend it as a place for economy.

The item of insurance covers only a premium for fire losses whereas it should also include an indemnity policy.

Our taxes we cannot avoid. Fifty dollars for cartage is for items paid out at times when our one horse cannot do all the work. The item of car fares include those spent when looking after work as well as for men going to and coming from jobs. One hundred dollars will hardly cover wear and tear on tools and new ones bought to replace broken ones. The item for a driver at nine dollars per week is very low for most localities and if we drive our own rig it costs much more than that. Waste materials include odds and ends of pipe, broken lengths of soil pipe, fittings with sand holes, etc. The next item cannot be definitely figured upon but in many cases proves very expensive, especially if we have used a cheap fixture when we should have used a garanteed one. Labor lost represents that time of our men for which we pay them and that cannot be accounted for in time spent on either contract or jobbing work, and this in a poorly conducted shop

is a serious item. Allowances are those amounts we allow our customers to deduct from their bills in order to get a settlement, although often unjustly claimed.

The item of $120 put down as interest on capital is what this amount would have earned if placed in a savings bank, and because of its being invested in our business is thus lost to us.

The balance of the items we all understand and they are necessary in the conduct of every business. You will notice I have omitted advertising but as in many places it is a necessity it should also be included.

These items foot up a total of nearly $4,000, but we will, as a conservative basis for our figurer to follow, call it an even $3,500.

The figures as tabulated herewith will indicate to you the margin of profit you will secure providing the cost of doing business is represented by one of the percentages in the upper line and you have added to the cost of labor and materials one of the percentages in the left-hand column. Your cost of doing business must be represented by the percentage which your expenses bear to your total sales.

As an example: If your cost of doing business is 20 per cent. of your sales and you have added to the cost of labor and materials 33 1-3 per cent., you will have made

placed before you to mislead you, they are definite and accurate and if you are not convinced of their accuracy, figure them out for yourself or get someone else to do it for you. I am trying to help you by calling your attention to conditions and facts, hoping thereby to make better business men of you, and to enable you to see wherein you have made a grievous mistake in not knowing your business.

We have a great many men in Detroit who have been trying to do business by adding 20 per cent. to their labor and materials and whose operating expenses are 20 per cent. of their sales, which indicate on the table a loss of 3 1-3 per cent. on the business they have done.

The man whose operating expenses are 20 per cent. of his sales cannot be a successful business man, unless he allows his margin of profit in the lower column, or 40 per cent. and the man who does not put such a per cent on his work is sinning against whom? Sinning against himself. I would suggest that when you go home you do not take the expense account which I have tabulated above, but that you make a careful examination of your books and find out what your operating expenses were for the year in 1909. Find out what your total sales were and by dividing the one by the other you will get the percentage

Table for Figuring Profits

	If your cost for doing business, figured on sales, equals one of these percentages															
and you add to your cost of labor and materials one of these percentages	5%	10%	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%
	20	6⅔	5⅔	4⅔	3⅔	2⅔	1⅔	⅔	⅓	1⅓ loss	2⅓ loss	3⅓ loss	4⅓ loss	5⅓ loss	6⅓ loss	7⅓ loss	8⅓ loss
	25	10	9	8	7	6	5	4	3	2	1	0	1 loss	2 loss	3 loss	4 loss	5 loss
	33⅓	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	40	18½	17½	16½	15½	14½	13½	12½	11½	10½	9½	8½	7½	6½	5½	4½	3½

your net profit will equal the percentage found in column under the percentage of expense, and opposite the percentage added to labor and materials. If your expenses are 20% and you add 33⅓% your net profit is 5%.

5 per cent. net profit on sales as shown in diagram. If your cost of doing business is 18 per cent. and you add 25 per cent. to cost of labor and materials your net profit is 2 per cent. of sales.

I realize that a heavy volume of business is done upon which is placed a less percentage than I have shown in the left hand column of the diagram, but when you have examined the table carefully and figured up your actual expenses you will find it would be foolish to consider such figures, as they must in all cases show a loss.

We will take for instance the man whose operating expenses are 15 per cent. of his gross sales, and who has secured his work by adding to the cost of labor and materials 20 per cent. He can expect if he has good luck and no accidents, to make 1 2-3 per cent. on the volume of his business. If his operating expenses are 20 per cent. of his sales and he has added 25 per cent. to the cost of labor and materials he has nothing left for profit.

Do not be misled into figuring small margins of profit because your supposed cost is only an estimate at best and your labor may be estimated too low, or your materials may be figured below what you afterwards find out you must pay for them, and either or both of these items must come from your estimated profit.

Now, gentlemen, these figures are not something I have

which they bear to one another. Then place yourself where you belong in the upper column, decide in your own mind how much profit you want, and figure your work for the balance of this year upon a percentage, which will enable you to face your loved ones to whom you owe more than all the rest.

As I stated at the outset there are two classes of work, jobbing or repair work and contract work. We will use for argument a $20,000 volume of business, one fifth of which, or $4,000, is jobbing work and the balance contracts. We estimate a gross profit on that $4,000 of $1,500. We will take the operating expenses into consideration as shown at $3,500. The jobbing sales is one fifth or 20 per cent. of the total sales, consequently the operating expenses will apply in the same ratio, one fifth of which, or $700, goes against the gross profit on the jobbing sales, leaving a net profit of $800 on that part of his business. There is still left $16,000 worth of work to be done under contract carrying on operating expense of the difference between $700 and $3,500 or $2,800. Figuring it back, we find that his cost of labor and materials is $13,333.33 showing a difference between labor and materials and sales, of $2,666.67 which is made up of operating expenses and profit. But, we have previously determined that his proportion of operating expenses applied against this work is

$2,800, or a loss of $133.33 on his work. To these operating expenses, as we stated, were 17½ per cent. of the sales, he added 20 per cent. profit on the labor and materials and produced a loss of $133.33. He has a loss of $133.33 on contracts and a gain of $800 on jobbing work showing a net gain of $666.67 on the total volume of business of $20,000.

Annual Business $20,000.00. Cost of doing business $3,500.00. Jobbing sales $4,000.00.

Gross profit estimated	$1,500.00
Cost doing business, 17½ per cent.	700.00
Net profit	$800.00

Contracts.

Cost of labor and materials	$13,333.33
20 per cent.	2,666.67
Contract sales	$16,000.00
Cost of operation, 17½ per cent.	2,800.00
Profit added	2,666.67
Net loss	**$133.33**
Profit on jobbing	$800.00
Loss on contracts	133.33
Net profit from business	$666.67

How many of you can show a better set of figures on your books to-day for your 1909 business? Why is this so? Simply because you have been misled in the method of operating your business. In other words, the volume of business is not what we should be after, the man that goes after the volume of business he is to transact, regardless of the profit that he will have at the end of the year, is taking a suicidal route, and as far as his financial life is concerned he had better stop before he starts.

We will start over again with the same amount of jobbing trade and the same profit accuring from it? This time his operating expenses are 20 per cent. and he puts on 25 per cent. in this case he is only making $700 on the jobbing end of his business. The labor and materials would have cost him on this basis $12,800 to which he has added 25 per cent. or $3,200. His operating expenses being 20 per cent. of his sales or $3,200, showing that on the entire amount of his contract work he made no profit.

Now we have a lot of men who are doing business on as poor a basis as this. Perhaps their operating expenses are 20 per cent. of their sales, and they are putting on 15 per cent., in that case the cost of labor and materials is $13,915, operating expenses $3,200 making a net loss of $1,115 on the contract sales. You have a profit of $700 on your jobbing so only have a net loss of $415.00 .

Now, gentlemen, my idea in bringing these figures to you in this way is a selfish one, absolutely. I told my association when I presented them figures of this kind I was not doing it for the benefit of the association, I was doing it for myself. Some men may be even so conscientious that they will be afraid, by putting on 33 1-3 or 35 per cent., they are robbing the public. You have to go a long way ahead of the figures I have here given before you have protected yourself, let alone robbing anybody. I submit the question to you now? Have you robbed anybody in the last ten years? You have robbed yourself.

The Basin Plumbing Co. has opened a modern establishment at Basin, Wyo.

The McFadden Plumbing & Heating Co., Newark, N. J., has been incorporated with a capital of $100,000. The incorporators are E. E. McFadden and H. M. McFadden, 60 Bayard St., New Brunswick, N. J.; John A. McFadden, 860 South 14th St., Newark, N. J.

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect James Knox Taylor, Treasury Department, Washington, D. C., will receive sealed proposals, as follows:

Until 3 p. m., May 4, 1910, for the construction, including plumbing, gas piping, heating and electric wiring systems, of the U. S. postoffice and courthouse at Charleston, W. Va.

Until 3 p. m., May 6, 1910, for the construction, including plumbing, heating, gas-fitting and electric wiring of the U. S. postoffice at Cleveland, Tenn.

Until 3 p. m., May 7, 1910, for the construction, including plumbing, heating, lighting and electric wiring, of the U. S. postoffice at Newark, O.

Until 3 p. m., May 9, 1910, for the construction, including plumbing, heating, lighting and electric wiring, of the U. S. postoffice at Austin, Minn.

Until 3 p. m., May 10, 1910, for the construction, including plumbing, heating, lighting, ventilating and electric wiring of the U. S. postoffice at Great Falls, Mont.

Until 3 p. m., May 12, 1910, for the construction, including plumbing, heating, lighting and electric wiring, of the U. S. postoffice at Appleton, Wis.

Until 3 p. m., May 13, 1910, for the construction, including plumbing, heating and electric wiring, of the U. S. postoffice and courthouse at Ottumwa, Ia.

Until 3 p. m., May 14, 1910, for the construction, including plumbing, heating, lighting and electric wiring, of the U. S. postoffice at Swickley, Pa.

Until 3 p. m., May 16, 1910, for the construction, including plumbing, heating, lighting and electric wiring, of the U. S. postoffice and courthouse at Shreveport, La.

Until 3 p. m., May 16, 1910, for a plumbing and drainage system at the U. S. postoffice at Belleville, Ill.

Until 3 p. m., May 19, 1910, for the construction (including plumbing, gas piping, heating and eelctric wiring) of the U. S. postoffice and court house at Cattletsburg, Ky.

Until 3 p. m., May 19, 1910, for the construction (including plumbing, gas-piping, heat and electric wiring) of the U. S. postoffice and court house at Cattletsburg, Ky.

All proposals should be in accord with drawings and specifications, copies of which can be obtained from the custodians of the above postoffices or from the office of the Supervising Architect at Washington, D. C.

CONTRACTS AWARDED.

Joseph Selleck, Monmouth, N. J., has been awarded the contract for the installation of an up-to-date plumbing system and a swimming pool in the new Monmouth Beach Clubhouse.

Putnam & MacKnight, Milton, Ore., have been awarded the contract for the plumbing and heating in the new Columbia College. Consideration $1,300.

The Frontier Plumbing & Heating Co., 353 Elliott St., Buffalo, N. Y., has been awarded the contract for the installation of a heating system in the new addition to the Statler hotel in that city.

E. G. Smith & Son, Dixon, Ill., have been awarded the contract for the plumbing in the new Odd Fellows building at Ashton, Ill.

Harding Bros., Canon City, Col., have been awarded the contract for plumbing and heating the Masonic Temple in that city. Consideration, $1,967.

The M. F. Rourke Co., Knoxville, Tenn., has secured the contract for the installation of plumbing and drainage systems at the new $100,000 passenger station in Cairo, Ill. The contract amounts to $10,000.

The following contracts have been awarded by the Wisconsin State capitol building commission for the new south wing of the capitol building in Madison: Plumbing, Charles Williams & Co., Minneapolis, $21,800; watermains, Joseph W. Mitchell, Madison, $10,630.

A contract aggregating about $70,000, for furnishing the iron pipe and special castings to be used for the water feeder that will be extended through the south side of Milwaukee this year, was recently awarded to the United States Cast Iron Pipe and Foundry Co. The Robert Rom Co., Milwaukee, was awarded the contract for furnishing the valves and gates for $4,095.

DOMESTIC ENGINEERING

THE OPEN DOOR TO WEALTH
IN HEALTH

TREATING SPECIFICALLY ON

SANITARY PLUMBING
HEATING
VENTILATING
STEAM-FITTING

ITS ESSENTIAL AIMS ARE THE ADVANCEMENT OF PRIVATE AND PUBLIC CLEANLINESS AND COMFORT AND THE FURNISHING OF STIMULATIVE EFFORT TO THOSE ENDEAVORING TO OBTAIN PERFECTION IN NATIONAL SANITATION.

Published Every Saturday by

The Domestic Engineering Co.

MAIN OFFICES,
323-325 Dearborn Street, Chicago, Ill.

NEW YORK OFFICE - - - - - - 150 Nassau Street

SUBSCRIPTION RATES:

United States, Cuba and Mexico.....$2.00 a year
Canada.....$3.00 a year
Other Foreign Countries.....$4.00 a year
Single copies of current issue, 10 cents; copies of back numbers, 25 cents each.

Remittances.—Subscriptions are payable in advance, and remittances should be made by check, Chicago draft, postal or express money order, in favor of "DOMESTIC ENGINEERING."

Change of address.—The old address should be given as well as the new, and notice should be received a week in advance of the desired change.

NOTICE TO ADVERTISERS.

Copy and cuts for advertisements intended for a particular issue should reach the office of Domestic Engineering on Monday of the previous week if it is desired that a proof of the advertisement shall be submitted. New advertisements can be received up to noon of Monday of the week of issue, but no proof can be shown.

Entered as Second-Class Matter at the Post Office at Chicago, Illinois, Under Act of Congress of March 3, 1879.

Member of the Chicago Trade Press Association.
Member of the Federation of the Trade Press Associations of the United States.

SPECIAL NOTICE TO READERS.

Our readers are invited to send in articles on any topics covering sanitary interests as outlined above. Photographs and drawings with descriptions of special interest to plumbers and steam-fitters are welcomed. "Domestic Engineering" pays at space rates for all articles, notes, criticisms and news data so contributed.

CONVENTION DATES.

Apr. 21, 1910.—Annual meeting of the Northwestern Master Plumbers' Association, at Meadville, Pa. Secretary, M. C. Judd, Meadville, Pa.

April 21 and 22, 1910.—Annual convention of the Associated Master Plumbers of Texas, at Houston, Tex. President, Joseph Netzler, Laredo; vice-president, P. J. Sheehan, Dallas; secretary, J. C. Netzler, Laredo; treasurer, A. H. Shafer, San Antonio, Tex.

Apr. 26-30, 1910.—The 30th annual convention of the American Water Works Association at New Orleans, La.

April 29 and 30, 1910.—Fifteenth annual convention of the Washington State Association of Master Plumbers, at Seattle, Wash. Headquarters at Butler hotel. President, A. M. Goddard, 2413 Pacific St., Tacoma, Wash.; secretary, James Griggs, 2805 S. 6th Ave., Tacoma, Wash.

May 3 and 4, 1910.—Annual convention of the Pennsylvania State Association of Master Plumbers, at Lancaster, Pa. Convention meetings in the Orange Street Opera House. Headquarters at the New Stevens House. President, Charles L. Titus, 37 Morgantown Street, Uniontown, Pa.; secretary, Harry L. Burd, 85 Gallatin Ave., Uniontown, Pa.; treasurer, John H. Birchall, Allentown, Pa.

May 10, 1910.—Ninth annual convention of the New Jersey State Association of Master Plumbers, at Paterson, N. J. Sessions in the Miriam Barnet Memorial School, corner Broadway and Erie Railroad. Officers: President, Geo. S. O'Neil, 41 Bridge St., Paterson, N. J.; secretary, Henry F. Baillet, 191 Clinton Ave., Newark.

May 11, 12 and 13, 1910.—The fifth annual convention of the National Supply & Machinery Dealers' Association and the eighth annual convention of the American Supply & Machinery Manufacturers' Association, in Atlantic City, N. J. These conventions will be held co-jointly.

June 1, 2 and 3, 1910.—Second annual convention of the National District Heating Association, at Toledo, O. Headquarters at the Boody House. President, A. C. Rogers; secretary, D. L. Gaskill, both of Toledo, O.

June 13, 14, 15 and 16, 1910.—The 22nd annual convention of the National Association of Master Steam and Hot Water Fitters, at Atlantic City, N. J. Headquarters at the St. Charles Hotel. President, Charles A. Geoghegan; vice-president, Edward B. Denny; treasurer, Juan A. Almirall; secretary, Henry B. Gombers, 260 West Broadway, New York city.

June 21 and 22, 1910.—Annual convention of the National Association of Brass Manufacturers, at Atlantic City, N. J. Commissioner, Wm. M. Webster, 1112 Schiller Bldg., Chicago.

June 28, 29 and 30, 1910.—The 28th annual convention of the National Association of Master Plumbers, in Chicago. The officers of the association are: President, Walter D. Nolan, 721 14th St., N. W., Washington, D. C.; vice-president, A. Selden Walker, 341 Main St., East Orange, N. J.; secretary, Samuel Artz, 3028 M St., N. W., Washington, D. C.; treasurer, William McCoach, 1607 Sansom St., Philadelphia.

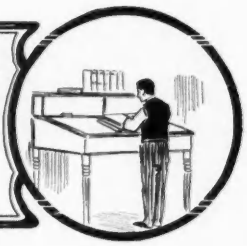
O. S. Chant has secured an interest in the plumbing business of R. W. Chant & Co., 301 West Main St., Watertown, N. Y., and the firm name has been changed to Chant Bros.

Howard Fegely, of the plumbing firm of Sharadin & Fegely, Kutztown, Pa., has purchased the interest of his partner, Francis Sharadin, and will hereafter conduct the business in his own name.

The plumbing and heating firm of Macfarlane & Shaffer, for 19 years engaged in business at Cumberland, Md., has been dissolved. George F. Shaffer retires and John B. Macfarlane will continue the business at the old stand, near the postoffice. The firm has had a most successful business career having handled many large contracts both in and out of the city.

BUSINESS MANAGEMENT

NEW METHODS FOR OLD



"WHERE SHOULD HE GO?"

Editor "Domestic Engineering":—I observe that in the April 2d issue of your magazine you have "taken a fall out" of me for the position I took in regard to your remarks relative to reserve funds, "enough to carry on the business a year without making a cent." When a man puts up a sign "Plumbing and Heating," over his door, lays in a small stock, takes out a license (if required) and goes after customers he certainly is in the plumbing business. As to whether or not his profits are as much as a journeyman's cuts no ice with the fact. It depends upon the man himself.

Perhaps the first year or more he will not save as much as the journeyman.

He has chances, however, and the journeyman has not.

In that same number (April 2d), you published on the picture page a lesson which proves the very inconsistency of your position. Now, when Mr. Witt started in business 19 years ago, doing the business with the assistance of one helper, he wasn't doing business with "a big B." You state also that he was doing business. You wouldn't for a moment accuse him of "playing marbles or making mud pies," and if he was, then we'd like a wedge of that same kind of pie.

The joke you told about the dago, who sub-contracted for $1.75 a day the job for which he got only $1.00, thereby losing 75 cents a day, is all right, but, Mr. Editor, you should have completed the story. Here it is: That Irishman didn't have sand enough to boss the business and the dago did. The dago was in business and lost on the subcontract, but he did it on time and satisfactorily using the Irishman's labor to best advantage.

The dago immediately nailed another job upon which he did not lose money and today employs fifty men upon teaming, carting and ditching work, and the dago is boss. There are in the South many fruit stands, confectionery stores, restaurants, etc., run by Greeks and Italians. When many of these people started, they started small and actually made less money than they paid their help. Were they in business or not? Today this class of business in many southern cities is practically controlled by Italians and Greeks, and some of them started with little or no capital.

There are hundreds of men running plumbing and heating businesses who started without a year's reserve funds in sight. They began to run a business when they opened upon their own hook.

If they didn't make as much as a journeyman at first, they ran a business just the same. Those who deserved to succeed are today much better off than the average journeyman, and those who failed would probably have failed at any other business.

Pacific Coast. "Y. Y."

"Y. Y." has certainly given his imagination the rein, and has ignored the danger-notice, which marks the approach of a dangerous down-grade. He says "When a man puts up a sign 'Plumbing and Heating' over his door, lays in a small stock, takes out a license (if required), or goes after customers, he **certainly** is in the plumbing business." The record of failures of men who took that course, shows that they **thought** they were **in** the plumbing business, but found themselves **outside** and the doors shut. As "Y. Y." pertinently says, "He has chances," and chance is a very poor foundation for business, as everyone who has made a success in business knows. Risks in business there always will be; chances we are not obliged to take, nor should we. "Y. Y.'s" equipment for business apparently consists of a sign above the door, a bag full of fittings, a license, which may or may not have been issued by competent men, or no license, which is as bad, and a package full of chances.

The man that started out with a business of this kind would have a mighty poor chance in competition with a thrifty and intelligent journeyman plumber, who, with enough cash to keep him from worrying for 12 months, assumed the duties and responsibilities of a master plumber.

Referring to our picture-page, which recorded Mr. Witt's success, what a man could do 19 years ago, and what he can and should do today, are two entirely different things. If Mr. Witt had the chance of starting over again he would cut out some of the heart-aches of his early days. "Y. Y." seems to be endeavoring to show how many difficulties one can undertake to labor under and yet come out ahead. In other words, "the longest way round is the shortest way home."

The mythical conclusion to the "dago story" sounds like the Arabian Nights, and has to be classed as light literature. How he could possibly use the Irish laborer to the best advantage, and lose 75 cents per day, is a mystery as perplexing as that of the "Man with the Iron Mask."

"Y. Y." is also unfortunate in his selection of Greeks and Italians as representative types of business men, and fruit stands, confectionery stores and restaurants as types of business establishments to be compared with the enterprises of the plumbing and heating engineers. It is true, that by a far-fetched analogy, we can think of a Grecian "bend" being investigated by a Roman candle.

"Y. Y." does not understand evidently that the stores of the Greeks and Italians are largely run by unpaid help, the newcomers from foreign countries signing a contract for from two years to three years' unpaid service in exchange for board and lodging, and the privilege of working and learning the language. The Italian banana-peddler does no business with architects and property-owners. Neither do the Greek candy-stores cater to the filling of municipal contracts. "Y. Y." should have gone a step further and brought in the Chinese laundryman as an example. When we answered our correspondent, we did not consider for a moment that he contemplated living while working under the same conditions as satisfy the Greek, Italian or the Chinaman.

We would call the readers' attention to our previous statement commented on adversely by our "Y. Y." critic. We stated that a man should have in sight enough reserve

funds to carry on the business one year without making a cent. Let us analyze that for a moment. What is meant by carrying on the business for one year? He should be able to pay his rent, his constant labor-cost, his lighting and heating bills, stationery and advertising expenses and should have enough to keep himself in the manner he has accustomed himself to live. If a man has a $30-a-week appetite, he must provide for its satisfying, and "dago contracts" taken at 75 cents a day loss are not going to help him any during the first year. The word "business" means to us an occupation which, to have a successful termination, involves these essentials: knowledge, energy, enthusiasm, time, thought, credit and cash. Our advice was given to a man who was not going to be forced into the business. He was going to choose his time and his place, and our advice was good and was based upon the experience of centuries. That many men have started without all these essentials and have won out, is a credit to them and an incentive to us to continue the good work of solving the difficulties which are only half as great or numerous as those they have met and overcome. To advocate that men should keep on commencing under difficulties and discouragements which they can avoid by foresight is **not business.**

SHOULD WORK EVER BE TAKEN AT A LOSS?

Editor "Domestic Engineering":—I would like to ask a very important question, which has a vital bearing upon all plumbing, heating and gas-fitting business. This is it: Should a master plumber or fitter ever take a contract on which he knows beforehand that he is going to lose money?

Chicago. X. Y. Z.

Should a man cut himself in order to use up all his old sticking plaster? Should one sip at carbolic acid in order to see what suicide feels like? What garantee have you that on the next contract the man will be able to make the two profits he is entitled for his labor? And if he did, he would be stealing an undue profit from the purchaser. Read Morgan's paper on "The Costs of the Plumbing Business" in this issue and go and sin no more by asking a question so disloyal to your own interests and the interests of the trade at large.

WHICH IS THE BETTER TRADE TO LEARN?

Editor "Domestic Engineering":—I notice that in the issue of March 26, you ask which trade a father (presumably wise) would advise his son to learn, plumbing or steamfitting? Why, steam-fitting, of course.

It takes a better man in every respect to be a fitter. He must be stronger physically (his very trade will make him so anyway), he must also be a man of better education. You take the average bunch of plumbers and fitters right through and as a class you find the steam fitters superior in every respect. A man who goes out and puts in a job of heating has to do nearly every job differently in some respects, whereas, plumbing is all pretty much alike.

Take the vacuum heating and hot-water heating. There are two systems entirely different in their action, yet a fitter must know them both, to say nothing of ordinary steam heating. A good fitter must know all this or he is not a fitter.

There are also many different systems of vacuum heating and again district steam and hot-water heating.

This heating branch of the business is growing rapidly. Steam and hot water heating has a great future before it. Look over various trade papers, newspapers and magazines and observe the number of heating systems and boilers that are advertised.

Why are all these people so busy and more starting in every day? Because there is a mighty good field for their efforts. In case the boy ever becomes a master fitter there is a larger percentage of profit in heating per dollar invested than there is in plumbing; the work is much more interesting, healthy and agreeable and when you have done a day's work at the heating game you can see something as the result of your efforts. A plumber can work all day in one little corner and you can't for the life of you see what he has accomplished.

Chicago. Steamfitter.

We do not exactly agree with our correspondent. It is probably a case of "every parent thinks his child the best."

MANY "EASY SELLERS."

Editor "Domestic Engineering":—In your issue of March 26, 1910, I see you ask for the names (in general) of "three easy sellers," referring, I suppose, to specialties. Now, I would like to say a few words.

Doubtless your intentions were all right but like the unmentionable place which is "paved with good intentions" (or was it the road leading thereto), this is certainly a "hot one." The fellows who ask you for easy sellers are very much like the fellow who claims that "the world owes him a living."

It isn't the article at all. It's the man behind the gun. He is the party who makes any specialty go. Some are expert enough to make a specialty appear in about any light they choose.

There are easily 1,000 articles directly connected or relating to the plumbing, gas, steam and hot water business which a reasonably good salesman can push and make a good profit on.

Now while some have a greater degree of merit than others, it is really the man behind the specialty that the success or failure depends upon, and because many do not sell well the master kicks while, if he would put as much effort into pushing them as he does in howling about dull times or this "cussed plumbing" business, all would be well. Very few of us in this world are fortunate enough to get something for nothing and if a man isn't willing to get out and work he simply doesn't deserve to succeed.

Portland, Ore. Wayne.

HUDSON PLUMBERS ADOPT NEW WAGE SCHEDULE.

The master plumber at Hudson, N. Y., have agreed to a new wage schedule which gives the journeymen an eight-hour day and 50 cents an hour.

PLUMBERS DEMAND HEALTH BOARD ABIDE BY LAW.

Nearly forty plumbers engaged in work at Bakersfield, Vt., quit their jobs last week and refuse to return to work until the Board of Health issues health certificates, as required by the State law. The walkout has paralyzed operations. At a recent meeting held by the plumbers the Board of Health was condemned for its laxity, and a resolution adopted providing that no plumbers resume work until examinations have been held.

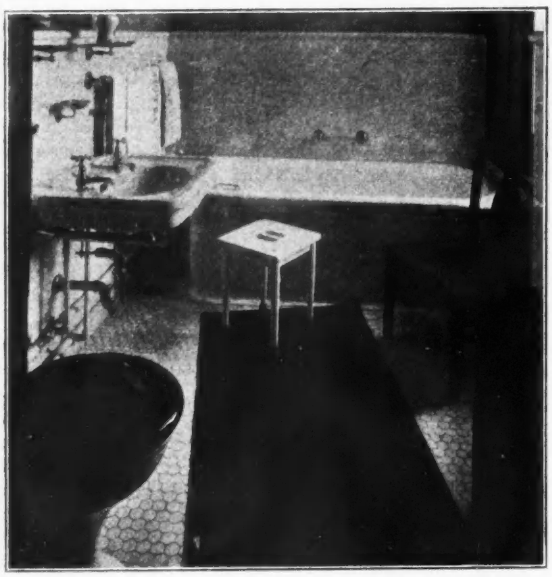
Some Noteworthy Features of the Plumbing in the Secor Hotel at Toledo, Ohio

By B. F. Baker, Toledo, O.

The Secor Hotel at Toledo, O., which was recently completed, is one of the best equipped and most modern hostelries between New York and Chicago, a short description of some of the most conspicuous features of its plumbing system will therefore be of more than ordinary interest to the readers of "Domestic Engineering".

This hotel is a handsome fire-proof structure of re-inforced concrete with a veneer of pressed brick. Elegant in its furnishings and decorations, with appointments showing great taste and refinement in selection, there is perhaps no feature of the equipment so attractive and satisfactory to guests as the superb sanitary arrangements which include all the latest and most up-to-date conveniences.

But few hotels of its size in the country are provided, as this is, with toilet facilities for every sleeping-room,



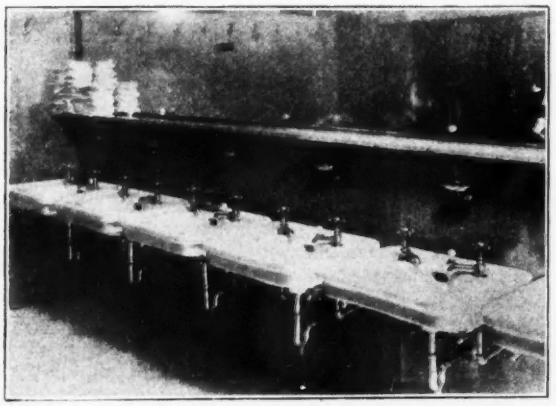
One of the Bath-Rooms in the Secor Hotel, Toledo, O.

and this luxury elicits the highest commendation from all visitors. One half of the 304 sleeping-rooms are provided with complete bath-rooms, the other half with modernly equipped toilet-rooms, so that every sleeping apartment is amply provided with toilet facilities.

The bath-tubs are of solid porcelain, fitted with low bell-supply and standing waste, the tubs being tiled in the corner of the room. The lavatories are of vitreous china, supported on concealed brackets, designed and patented by the National Supply Co., Toledo, O., which company furnished the plumbing material used throughout the building. The installation was made so as to present the smallest possible amount of exposed nickel-plated pipe, a fact which greatly reduces the labor in caring for the bath-rooms.

The lavatories are fitted with compression basin-faucets and with "National" pop-up basin-waste. All pipes are carried to the wall, thus leaving the floor space free from obstruction, adding to the appearance and neatness of the room as well as diminishing the labor in cleaning the apartment.

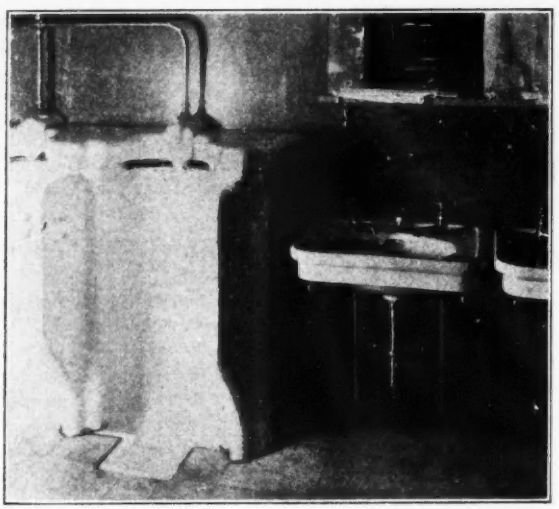
The tubs and lavatories were manufactured by the Trenton Potteries Co.



Battery of Vitreous-China Lavatories in General Toilet Room in the Secor Hotel, Toledo, O.

Each toilet-room is fitted with a closet and lavatory, of the same pattern as those used in the bath-rooms. The closets throughout the building are the "Vigilant" siphon-jets with low down mahogany tank and seat.

All bath and toilet-rooms are equipped with handsome



Portion of Toilet Room in Connection with Billiard Room in the Secor Hotel.

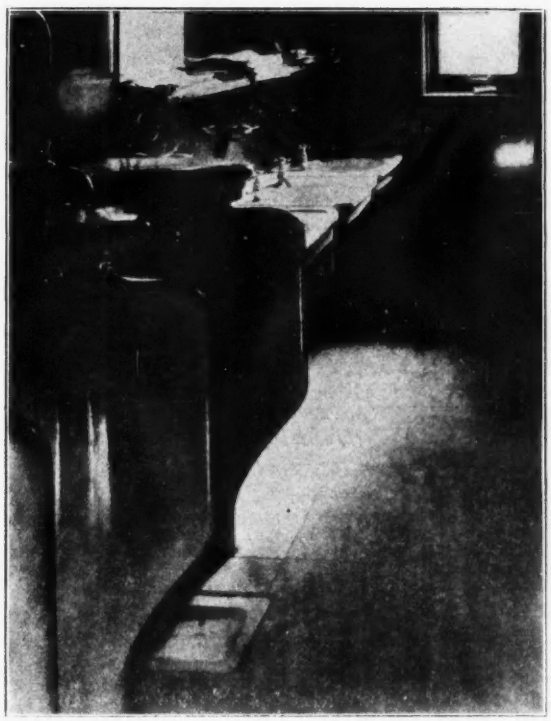
French bevel-plate mirrors, in nickel-plated frames, glass towel-rails, with nickel-plated ball brackets and nickel-plated soap dishes. They are also fitted with glass shelves supported by "National" locking brackets, a special design which locks the glass, thus reducing to a minimum the danger of breakage. All bath and toilet-rooms have tiled floors and walls.

In addition to these facilities the basement is fitted with a large general toilet-room, which is equipped with a battery of vitreous-china lavatories of the same type as is used in other rooms, and a large mirror extending the entire length of the battery, with marble shelf, supported by nickel-plated brackets. This in connection with an ample number of closets and a battery of solid-porcelain vertical urinals, supplied from an automatic tank, provides ample facilities for guests and employes.

Adjoining the magnificent billiard room, is a toilet-room fitted out with a battery of lavatories and a range of solid-porcelain urinals.

The fittings of the barber shop connected with the hotel are ultra-modern and a better sanitary arrangement could not be secured.

Each chair is provided with a vitreous-china lavatory,



Another View of Toilet Room near Billiard Room in the Secor Hotel.

the same design that is in use throughout the hotel, and is provided with a combination shampoo fixture connected direct from the wall with a swinging tube.

Each lavatory has a glass towel-rack and other necessary equipment. A sterilizing plant insures absolute cleanliness, as every towel in the shop is sterilized before being used.

In keeping with these sanitary arrangements is the mechanical equipment. Fresh air is constantly supplied by four large fans, each operated by direct-connected motor and providing ample ventilation for the entire building. All air passing through these fans is first passed through a McCreery air-washer which thoroughly removes all dust before it passes to the fans, thus protecting the wall decorations from injury.

The culinary department is fitted out with every modern device for cleanliness and the saving of time and energy. There is an automatic elevator carrying the dishes and food from the basement to the serving room, between two large dining rooms on the first floor, a mechanical dishwasher, convenient sinks and many other arrangements which make this a specially well equipped inn.

Water is supplied throughout the building from a 10-in. artesian well, an air lift being used for conducting the water to the building. Every room in the house is supplied with this fresh pure water while an artistic fountain supplied with this pure water adorns the lobby. This fountain represents a rural water scene and an imitation frog holds the place of honor in the center. This fountain gives a constant flow of pure water.

The plumbing was installed in this building by Eagen Bros., of Toledo, at a cost of about $90,000, and a Toledo architect, George S. Mills, designed the structure.

MAINE.

The bids for the installation of the heating apparatus and plumbing in the new dormitory of the Maine state normal school at Castine, Me., were opened a few days ago. The contract for the plumbing was placed with H. F. Fuller & Co., Portland, and for the heating with Wiley & Calhoun, of Portland. The complete list of proposals received by the committee was as follows: Heating: C. H. Babb & Co., Bangor, $3,231; Reed, Stewart and Blount, Showhegan, $3,188.44; A. H. Moulton, Portland, $2,640; Frank T. Young & Co., Bar Harbor $3,420; Leighton Plumbing & Heating Co., Bangor, $3,374; McLean & Cousens, Boston, $3,152; H. F. Fuller & Co., Portland, $3,600; Walworth Construction & Supply Co., Boston, $2,545; Charles R. Perkins, Castine, $2,800; Frank E. Rea, Castine, $2,671.77; R. B. Brown & Co., Castine, $2,600; Arthur B. Fels, Portland, $2,780; C. A. Tilton & Co., South Portland, $3,341.42; Wiley & Calhoun, Portland, $2,539; F. E. Wheeler, Woodfords, $3,268; Arthur Shea, Rockland, $2,732.75; Rockland Hardware Co., Rockland, $2,781.—Plumbing: C. H. Babb & Co., Bangor, $2,756; Reed, Stewart & Blount, Showhegan, $3,489.20; Frank T. Young & Co., Bar Harbor, $3,461; Leighton Plumbing & Heating Co., Bangor, $2,772; H. F. Fuller & Co., Portland, $2,262; Frank E. Rea, Castine, $2,793.78; C. A. Tiltson & Co., South Portland, $2,985; J. H. Chase Co., Lewiston, $3,336; F. E. Wheeler, Woodfords, $2,567; Arthur Shea, Rockland, $2,969.08.

F. A. Noble and Arthur Young, of Pittsfield, Me., have purchased a tinware and plumbing business at Hartland, Me.

RHODE ISLAND.

The contract for plumbing the block which R. William Hampson will soon erect on West Main St. has been awarded to the Barlow Bros. Co., Waterbury, Conn.

William J. Wilson, Spruce St., South Manchester, Conn., is preparing to move his plumbing establishment to West Center St., in that town.

Taylor & Taylor, Meriden, Conn., have been awarded the contract for all plumbing and for the installation of a new steam plant at Undercliffe Sanatorium. The amount of the contracts is between $3,000 and $4,000.

The public property committee of the city council of Brockton, Mass., has awarded a contract for additions to the heating system at the city hall to James T. Corcoran. The other bidders were V. R. Donovan and the Kenney Heating & Supply Co.

The common council at Brockton, Mass., has gone on record as opposed to limiting the public property committee to local firms in placing the contract for the new high-school heating plant. The aldermen so voted but the council decided that it was a matter which had best first be referred to the city solicitor to learn as to the authority on this point.

The town of Leominister, Mass., is considering the matter of the erection of a central heating plant for the town buildings. The matter was discussed at a recent meeting of the voters, but no definite decision was reached, although the general sentiment appeared to be against the proposition.

QUESTION ABOUT HOT-WATER SUPPLY JOB.

Editor "Domestic Engineering":—I am enclosing a sketch (see Fig. 1) of a job with piping complete. Please make any corrections you see fit to improve the work, the idea is to get hot water for domestic purposes and heat the kitchen, the water circulates through the radiator at present but not through the boiler.

This job is in at present but does not heat the water in the boiler.

Philadelphia, Pa. S. M. C.

This job does not work because as installed the circulation favors the radiator entirely and the range-boiler has not the first chance to succeed.

If the correspondent will extend the vertical hot-water supply pipe where it first rises as it leaves the furnace (at point X) say eight or ten ft. and then pass over and drop down directly into the range-boiler he will heat it all right.

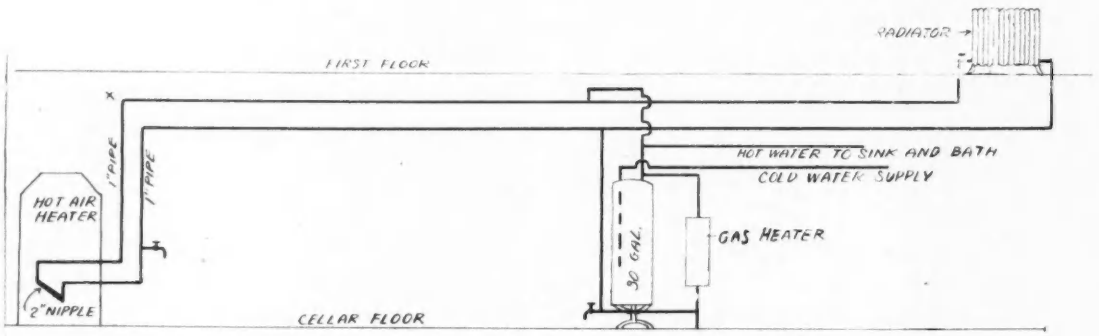


Fig. 1. Sketch of Kitchen-Heating and Hot-Water Supply Job.

The radiator can be heated from the drop riser which will then pass into the range-boiler top.

On a natural circulation he can not expect to force water below the coil unless he has some weight to do it and this, as the job is now hooked up, he has not got. It might be possible also by raising the range-boiler a foot or two, to run the hot-water supply pipe from the coil directly into the side of the range boiler, similar to the usual "hook up."

The radiator could be supplied just before going into range-boiler by a tee. It should be a divided tee, however, or he could "smother" the supply valve on the radiator. Otherwise the radiator would tend to rob the heat from the range-boiler just as second-story hot-water radiators rob first-story radiators on ordinary hot-water heating jobs.

PROFESSIONAL MEN RESPONSIBLE FOR WASHINGTON PLUMBING CODE.

Editor "Domestic Engineering":—I note the latter in issue of April 2d, by Henry J. Allen, Washington, and wish to state that the present inspector of plumbing of this city is not responsible for the table of sewers to drain the various drainage areas as provided in the District of Columbia Plumbing Code, but must rule in each case in accordance therewith.

In suburban conditions a special schedule providing for smaller size sewers is on file in this office and is available to Mr. Allen or any other plumber who takes a sufficient amount of interest in his work to have it done other than in a haphazard way. The said schedule was compiled by professional men of undoubted standing and I think it illy becomes a licensed plumber of any city to question the reliability of such a schedule unless he is fully competent to do so. Yours very truly,

A. R. McGonegal,

Washington, D. C. Inspector of Plumbing.

HOW MANY FEET OF RADIATION ON A RANGE BOILER?

Editor "Domestic Engineering":—I notice in your March 26th issue a new rule for finding surface measure in square feet of outside of range-boiler in your answer to "S. V." of Scranton, Pa. Should he try this formula, he no doubt will wonder where he is at.

You, no doubt, intended to give the rule: Multiply the diameter in inches by 3.1416 to find the circumference. This product multiplied by the height of boiler in inches will give number of square inches of heating surface on outside of range-boiler and by dividing this by 144 you will have the number of square feet of heating surface of boiler. This, of course, would ignore the surface of head in boiler.

Why not give it to him easy and say, measure the circumference of boiler in inches and multiply by the height in inches and divide by 144.

I bring the above to your attention so "S. V." may not be misled by the rule as given.

Kingston, N. Y. L.

Editor "Domestic Engineering":—In your March 26th issue, page 307, "S. V.," Scranton, Pa., asks a question about "How to Find the Amount of Heating Surface in a Range-Boiler," in answer to which you told him to square the diameter, multiply by .7854, which will give the area in square inches of heating surface in the boiler. Multi-

ply by the height, it will give the number of square inches of heating surface of the boiler, and dividing this by 144 will give the number of square feet in any boiler. You claim that the range-boiler in your kitchen being 13 in. in diameter and 5 ft. high has only 4½ sq. ft. of heating surface.

A more proper way (which I believe to be right) to find the surface of the boiler is to multiply the height by the areas of the top and bottom of the boiler and divide the total square inches by 144, which in your case, a boiler 13 in. in diameter and 5 ft. high, would be 18¾ ft. of heating surface. Here is the way I figure it:

Boiler diameter, 13 in., multiplied by 3.1416 equals 40.481, multiplied by 60 in., equals 2450 sq. in., then divide by 144, which gives you 17 sq. ft. of surface in the height and circumference, then we still have the top and bottom, the areas of which equals 265 sq. in. of heating surface in a boiler 5 ft. high and 13 in. in diameter.

Holland, Mich. "Faithful Reader."

Editor "Domestic Engineering":—In your issue of March 26, 1910, page 307, I note the question: "How Many Feet of Radiation in Range-Boiler?". I wish to correct your rule for finding the sq. ft. area.

Your rule reads: "Square the diameter and multiply by .7854, which gives the area (this is correct). This product multiplied by height in inches will give the square inches of heating surface in boiler (this is wrong). Below note my way:

Boiler, 13 in. in dia., 60 in. in height.—13 in. × .7854 = 132.73 sq. in., area of head. 13 in. × 3.1416 × 60 in. = 2450.40 sq. in., area of outside of boiler. Area of head and area of outside of boiler amount to 2583 sq. in. This divided by 144 (sq. in.) gives nearly 18 sq. ft. heating surface, where you have only 4½ sq. ft.

Columbus, Kan. L. E. Scovell.

Editor "Domestic Engineering":—Referring to Vol. L., No. 13, March 26, 1910, page 307, I would like to call your attention to a rule for finding the radiation of a range-boiler. You are very much in error. Take a piece of iron 1 ft. wide and 4½ ft. long and try to make a cylinder 13 in. in diameter and 5 ft. long from it. Here is a formula, all measurements in inches:

$$\frac{\text{dia.}^2 \times 1.57 + \text{dia.} \times 3.1416 \times \text{length}}{144} = \text{sq. ft. surface.}$$

Hastings, Minn. Theo. Nelson.

Editor "Domestic Engineering":—Please pardon me for "butting in," but in your issue of March 26, 1910, page 307, I notice that you, through an oversight, have given the wrong answer to the question of "S. V.," which was: "How many feet of radiation on a range-boiler?" The rule you gave as an answer is for finding the cubical contents of the boiler.

Here is the rule which I think you intended to give: "Multiply the diameter of boiler by 3.1416, which gives the circumference; multiply this result by the height of boiler in inches and divide the product by 144, which gives surface of boiler in square feet, except the head, which is found by your rule; square the diameter and multiply by .7845, divide product by 144 and result is square-foot surface of boiler-head.

Thus: To find square feet of heating surface on a range-boiler, 13 in. in diameter, and 5 ft. high., you can proceed as follows:

13 in. × 3.1416 = 40.8308 in. × 60 in. = 2449.848 sq. in. ÷ 144 = 17.012 sq. ft.

Boiler-head 13 in. × 13 in. = 169 sq. in. × .7854 = 132.7326 in. ÷ 144 = .914

Total heating surface, 17.926 sq. ft.

Referring to the question of "Ignorance," page 307, of issue March 26, will say there is no advantage in having "high points" in a water line running for several miles since the air collects in these places and if the air is not drawn off the pipe will become air-bound which greatly retards the flow of water.

This has been my experience with a pipe 4 ft. in diameter and 4 miles long.

I enjoy your paper very much and reap my share of benefits from it. Sincerely yours,

Encampment, Wyo. A. N. McManis.

SUGGESTS CURE FOR REVERSING COIL.

Editor "Domestic Engineering":—I have read with interest the question, "Why the Coil Reverses," and the several answers suggesting remedies for curing the defect. I enclose herewith a sketch (Fig. 2), showing what I consider the easiest way of curing this sick job. I am quite

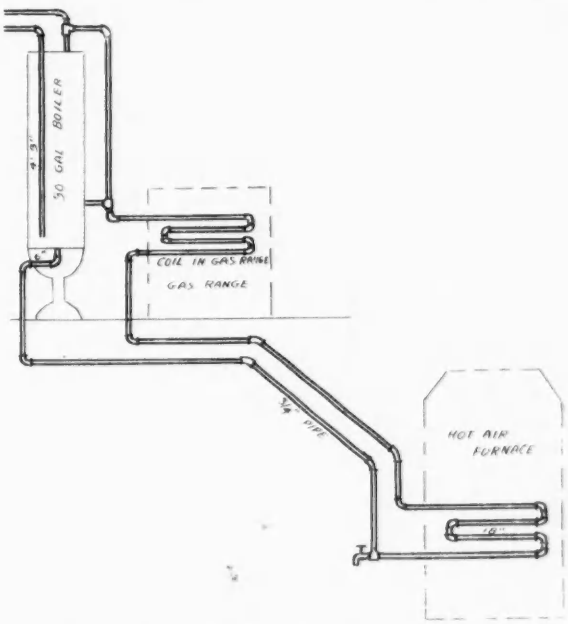


Fig. 2. Sketch Showing Suggested Cure for Reversing Coil.

sure that when "Westerner" has connected the coils to the boiler in the manner suggested by this sketch the system will work silently and not reverse whether the water is heated by the gas range or by the hot-air furnace, and it will also prove an economical system.

San Francisco, Cal. S. P.

WHERE WOULD YOU LOCATE THE SINK?

Editor "Domestic Engineering."—Is there any set rule for the height of a kitchen sink? My observation is that the majority of sinks are placed too low, and I believe the plumbers can confer a boon on housewives by giving this subject some earnest consideration. Sinks, that are placed too low, cause the person using them to work for hours at a time in a stooping posture which is done at

the expense of a severe backache. There is nothing in the category of household duties that inflicts as much unnecessary punishment as a sink placed too low. As a rule its elevation a few inches would obviate the trouble. Would it not be a good idea for the plumber to discuss this question with "the woman of the house" before setting the sink? A sink placed so that the person working at it can stand in an erect position, or nearly so, would greatly lighten the labor. There is another point about kitchen sinks on which householders need education, and that is its location. Generally the sink is shoved over in the darkest corner of the kitchen. There is no other thing in the room except the range which is used more. A sink ought to be close to a window, where there is light and air. C. N. W.

THE AUGUSTA STEAM JOB WHICH FAILED.

Editor "Domestic Engineering":—I notice the steam-heating plant (See Fig. 3 by "M. C. P." of Augusta, Ga., in March 26th issue which, he says, fails to get "results." Just what he means by results I do not have the means of knowing, but when he says that 25-lb. steam don't get action I think I can imagine what the trouble is. I haven't a catalog handy of the boiler, but for this job it ought to be rated to carry at least 1,200 ft. radiation, and 1,400 would be better. I should imagine that the radiation on the 1¼-in. and 1½-in. lines did not give much trouble. Now on the 2-in. line he has 145 feet of direct and 625 feet of indirect radiation attached, a total of 770 ft. of radiation on a 2-in. pipe. Now I have always assumed that an indirect radiator would kill at least 1-3 more steam than a direct radiator. Some people figure it 50 per cent more. If this is so, then the total amount that the 2-in. line is trying to carry is 625 + 312½ + 145 or 1,082½ ft. of radiation. At 1-3 more allowed for the indirects it would be 978 1-3 sq. ft. Now as 400 ft. will hustle a 2-in. pipe to supply in most cases, it appears that the 2-in. line should be increased. I would increase the line to at least a 3-in. main to just beyond the point where the 1½-in. line is taken off to supply the upstairs radiators and I would supply the other two indirects from a 2-in. pipe.

Chicago. G. E. W.

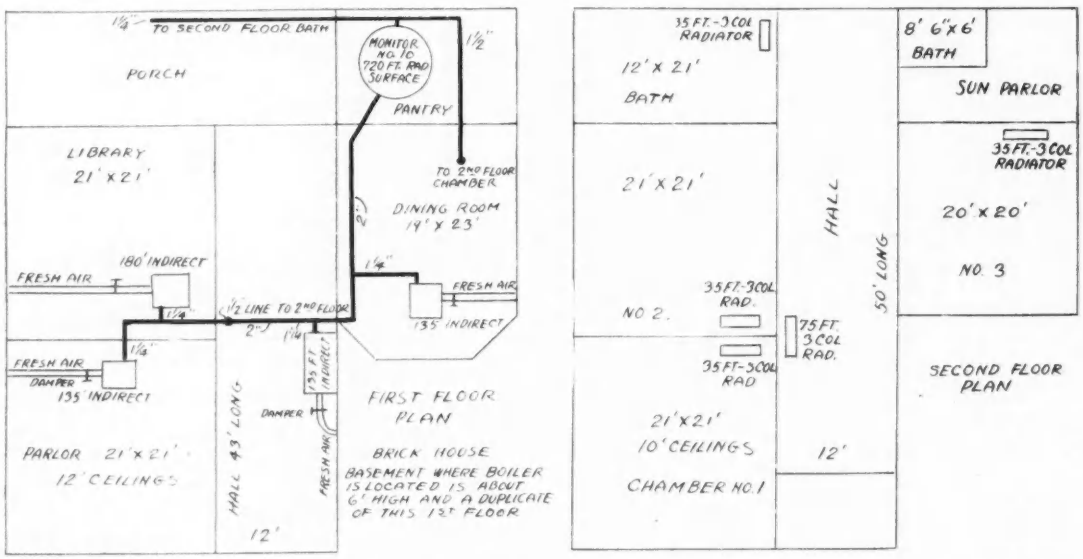


Fig. 3. Plan of "Augusta" Steam-Heating Installation, Which Is Unsatisfactory, Submitted by M. C. P.

It therefore appears that the boiler is entirely inadequate, and this also applies to the mains. We suggest a 1,900-ft. boiler, a 3-in. main steam-pipe, leaving the boiler to feed the indirect radiators, a 2-in. line branching 1½ in. each way to feed the direct radiators in the rear part of the building, with 2-in. return main from the front, and 1½ in. at the boiler for the rear; the boiler to be covered with asbestos cement 1½ in. thick, and piping with asbestos sectional or air-cell covering.

With this system 2-lb. pressure will be sufficient to warm the building to a temperature of 70 degrees with the outside temperature at zero.

Meadville, Pa. G. S. D.

Editor "Domestic Engineering":—Replying to the inquiry of "M. C. P.," Augusta, Ga., in your issue of March 26, 1910, I wish to say that he gives insufficient data from which to work intelligently. He does not give the glass surface, points of compass, whether walls are furred out or not; he does not show returns, and he does not state whether the direct radiators are one-pipe or two-pipe, as, while he states that this is a two-pipe system, that might be construed to apply to indirect radiation only.

Figuring the normal amount of glass surface for rooms in residence of this character, we suggest that the amounts of radiation should be increased 30 ft. each in parlor, hall and dining room (see Fig. 3); while the direct radiation should be: Chamber—No. 1, 70 ft.; No. 2, 45 ft.; No. 3, 65 ft.; hall, as it now is, and bath-room 50 ft. These amounts of radiation with the additional tax imposed by indirect radiation would amount to about 1,250 ft. Adding 25 per cent for additional tax due to piping, makes a total of about 1,560 ft.

We will be glad to receive impressions from our readers concerning the industry in their locality. A line or two now and then is appreciated by the dullest editor Don't be afraid to cut loose.

ADVANTAGES OF HAVING AIR-LINES ON STEAM RADIATORS, EITHER WITH OR WITHOUT VACUUM PUMP.

By Emmons Collins, B. S., E. E., M. E.

Many prominent engineers and architects are advocating the use of air-lines on all steam-heating work, regardless of source of steam or size of building.

An automatic air-valve is used provided with a union at the bottom to take a ¼-in. pipe. All air, gases and vapor are conducted through this pipe, which leads to the basement, discharging into a convenient sink or drain. Theoretically there is no water escaping from the automatic air-valves as they are supposed to close off when steam strikes them. In practice they frequently are found discharging water on the floor, causing much injury.

In schools, hospitals, fine residences, etc., it is undesirable to have the ill-smelling gases of the heating system discharged into the room for health reasons.

Hotels, office and flat buildings require this pattern of air-vent because ordinary air-valves are constantly tampered with by the occupants of such structures. These air-valves are adjusted by breaking the union connecting it to the air-line pipe, and as a wrench and screwdriver are required few people will undertake to break a pipe connection. It takes no longer to adjust an air-line valve than any other, if one is familiar with its construction.

The common practice for air-line pipe sizes for buildings up to 12 stories high with 20,000 sq. ft. radiation down to 1-story buildings with 1,000 sq. ft. is the same.

Starting from the sink in the basement a 1-in. pipe is run around it reaching points where the vertical steam risers are located. At these points a ½-in. vertical pipe is connected to the 1-in. air-line. Each radiator is connected to this vertical ½-in. pipe with a ¼-in. pipe connected to the air-valve.

The same grade of pipe is used for air-lines as for steam. Joints are made with asphaltum on outside of threads and pipes and fittings are painted outside with the same material.

The additional cost of running air-line pipes and using air-pipe valves will average from $3 to $4 per radiator. This small extra expense is well worth while and will more than pay for itself each year in saving carpets, plastering and health.

There is another very important reason why every building should have air-line pipes on the steam radiators. The steamfitter can, at any future time, transform an ordinary heating plant into the best kind of a vacuum steam-heating system by merely purchasing a reliable vacuum pump, a couple of valves and a few feet of pipe.

There are several advantages of having a suction pump on the end of the air-line should the building be heated with a low pressure steam boiler. In the first place, as the pump draws the air out of the radiators, the instant a radiator valve is opened steam rushes in and the entire radiator becomes hot almost instantly. If a pump is used steam will be generated and the radiators will become hot soon after a fire is made in the boiler. It will be necessary to evaporate twice the amount of water to get a circulation of steam in the radiators without a vacuum pump than with one. Stated another way, if no pump is used more coal must be burned in order to vaporize the water and a relatively high steam pressure must be generated before steam will fill the radiators. Furthermore the radiators will remain hot a long time after the fire goes down if a pump is used, as no air can enter the radiators when the steam pressure reaches zero on the gage, but on the other hand steam will be generated and fill the radiators when the gage shows 10 lb. less than zero pressure. This is an important factor in small buildings when a fireman is not always at the boiler to keep up steam.

Where a building may possibly at some future time utilize exhaust steam from a neighboring power plant, or avail itself of central-station exhaust heating a vacuum pump on the air-line probably will be a necessity. By its use a building can be heated with no back pressure on the engine, or in other words a building can circulate steam at a low pressure available which could not be done without a pump.

Again in central-station heating work a building having a vacuum pump will get steam, while buildings without a pump and nearer the power house where the pressure is higher may not get a circulation of steam.

Fuel bills are cut down through the use of a vacuum pump. This applies to both low-pressure boiler plants and buildings using central-station steam.

Taking the latter case, for example, and assume a meter is used and the pressure remains constant at 5 lb. on the customer's heating system. If the pressure were reduced the plant would not circulate steam. If there is enough radiation to heat the building to 70 deg. in zero weather, there will be too much heat in three-quarters of the heating season, when the outside temperature is comparatively mild. If we have a vacuum pump the steam-valve at the building may be salf closed, admitting only one-half the amount of steam as before, and the system will circulate and the tenant will have a mild degree of heat, more suitable for the warmer winter weather. The inlet valve at the service main may be automatically regulated to admit the proper amount of steam to the building by a thermostat placed out of doors. I do not know of such a device as yet being on the market, but it is to be expected.

If a heating boiler on the premises supplies steam, a saving in fuel will result by building only a moderate fire and thus producing steam at a low temperature. In severe weather greater fire will be made and we will have steam at higher temperatures and pressures.

Thus there are several reasons why the air-line pipe should be used on any building—and better still, connect the air-line with a vacuum pump.

There is now a vacuum pump on the market which is operated by city-water pressure, and it is used on any pressure ranging from 15 up to 150 lb.

This pump has two cylinders, one above the other, one being the motor end and the other the suction end. A vacuum pump governor controls the water inlet, so that the pump runs only intermittently.

As for cost of water to run the pump, this will be about 50 cents per month per 1,000 sq. ft. of radiation, assuming water to cost 25 cents per 1,000 gallons (the Chicago rate is less than 10 cents). Where a flat rate is in force some water companies charge $3 per heating season. On central-station work the discharge from the air-line is piped to meter, as there is usually a small drip. On low-pressure work the drip is led to the sink. The pump will produce as high as 25 in. vacuum, but there is no object in having it set to carry more than 5 in. vacuum. This is because there is at most times no relation between vacuum on the air-lines and the pressure on the boiler. For instance, the boiler may show 10 lb., 5 lb., 0 lb., 5 in. or 20 in., but the gage on the air-line may all the while

may show 5 in. vacuum. This is accounted for by the fact that the air-line is closed off from the radiators when the latter are hot.

When the boiler is cold the vacuum gages on it and at vacuum the pump will register the same.

Electric vacuum pumps have been used as exhausters, but they have certain inherent objections. These are usually driven by an armature revolving at 1,500 to 2,000 revolutions per minute, therefore the moving parts have considerable momentum.

In air-lines it is well known that a valve is liable to open up and drop a slug of water in a long run of pipe, and when this strikes the pump an enormous overload is thrown on the armature and it frequently burns out, requiring expensive and annoying repairs. To overcome this defect, one of the largest makers of electric air pumps has introduced a slow-acting hydraulic vacuum pump, which has a speed of only ten single strokes per minute, but the air cylinder is of sufficiently large diameter to do the work required for any size of building. With such a slow-moving machine the shock resulting from water slugs does not injure the pump in the least.

Among the Wholesalers

WILL MAKE HEAT RETAINERS.

The Fay Sole Heat Retainer Co., Insurance Bldg., Oklahoma City, Okla., has been incorporated with a capital of $50,000 to manufacture heating specialties. The incorporators are W. R. Fay, C. W. Tennant, J. F. Murphy and Henry Roup.

NATIONAL VENTILATING CO. SELLS ITS PLANT.

The National Ventilating Co., Harrison, N. J., has sold its plant on Railroad avenue and Fifth street in that town. The plant has a frontage of 125 feet on Railroad avenue and 200 feet on Fifth street. The price is said to have been in the neighborhood of $15,000.

CHANCE FOR PACIFIC COAST REPRESENTATION

cation to the business manager of "Domestic Engineering," knows of a manufacturers' agent in San Francisco, who would like to secure one or two more strong lines in plumbing and heating supplies. Manufacturers desiring to correspond with him can get in touch with him on application to the business manager of "Domestic Engineering," 323-325 Dearborn St., Chicago.

IRON CITY SANITARY MANUFACTURING COMPANY MOVES HEADQUARTERS.

The Iron City Sanitary Mfg. Co., Pittsburgh, Pa., has just stolen a march on moving day, beating May 1 by 30 days. In a handsome circular, it announces the removal of its general offices to the new Oliver Bldg., occupying rooms 1512-1516. The above company is well known to the trade as manufacturing plumbers' porcelain-enameled cast-iron ware, baths, lavatories, sinks, laundry trays, etc. The officers of the company are: President, A. A. Frauenheim; vice-president, C. A. Fagan; secretary and treasurer, John A. Kelly.

APRIL MEETING OF THE ILLINOIS CHAPTER.

The Illinois Chapter of the American Society of Heating and Ventilating Engineers held its regular monthly meeting on Monday evening, April 11th, at Vogelsang's restaurant on Madison street in Chicago, with a good attendance. After the regular order of business had been transacted a most interesting paper was read by George Mehring, describing and illustrating with the original plans the large hot-water heating system installed at Armour's new summer home near Lake Forest, Ill., containing nearly sixty rooms. John Boylston, of the Western Steam Specialty Co., followed with an interesting talk on Pressure Regulating Valves, both from the manufacturer's and the heating engineer's standpoint.

PLAN TO BUY TWO POTTERIES.

George W. Bowers, president of the Homewood Pottery Co., Mannington, W. Va., has conferred with the bondholders of the Wheeling Potteries Co., of Wheeling, W. Va., with a view of purchasing the LaBelle and Wheeling potteries. Should the Homewood company take over these two plants which have been used for the manufacture of general or domestic pottery, they will be converted into sanitary pottery plants. The Wheeling Potteries Co. desires to dispose of the plants for $75,000 and 6 per cent. on all bonds. The Homewood company offered $60,000 and 5 per cent. on bonds. However, at a conference just held, the Homewood company offered to pay the $75,000 for the two plants, but refused to pay 6 per cent. on the bonds, and this is all that stands between the closing of the deal. The Wheeling Board of Trade is hopeful of the situation and is of the opinion that ere another fortnight passes the two plants will have been disposed of and work started placing them in readiness for operation.

ILLINOIS MALLEABLE COMPLETES LARGE ADDITION.

The Illinois Malleable Iron Co., Chicago, has recently completed a 130x140 ft. addition to its malleable plant, and it is at present building a six-story grey iron erecting shop, 80x130 ft.

WILL COVER ENTIRE COUNTRY.

The Galard Co., Newark, N. J., manufacturers of "Omala" finished white seats, tanks and other bathroom furnishings, in addition to the establishment of branch offices in New York, Chicago, Albany, Philadelphia, Baltimore and New Orleans, with a local representative in each, has secured the services of Earl W. Barnes, who will act as its general traveling representative covering territory not served by its local offices. Mr. Barnes is well known in plumbing trade circles throughout the eastern section of the country through his long association with the trade press.

BRISK DEMAND FOR EXHIBIT SPACE AT THE CHICAGO CONVENTION OF THE N. A. M. P.

The arrangement committee in charge of the exhibit space at the 28th annual convention of the National Association of Master Plumbers, which is to be held in Chicago June 28, 29 and 30, 1910, reports a brisk demand for such space and that the outlook for a representative exhibition of plumbing and heating goods is very bright. Exhibit rooms on the Mezzanine floor of Orchestra hall, Chicago (see diagram on page 20, April 2nd issue of "Domestic Engineering"), have been leased to the following concerns: No. 1, Nye Tool & Machine Works, Chicago; No. 2, Galard Co., Newark, N. J.; No. 3, Compound Injector & Specialty Co., Chicago; No. 4, Wade Iron Sanitary Mfg. Co., Chicago; Nos. 5 and 6, Wolverine Brass Works, Grand Rapids, Mich.; No. 7, Pressed Radiator Co., Pittsburgh, Pa.; No. 8, E. B. Badger & Sons Co., Boston; Nos. 17 and 18, The Peerless Selling Co., Evansville, Ind.; No. 19, Pittsburgh Plate Glass Co., Pittsburgh; No. 25, Glauber Brass Mfg. Co., Cleveland, O.; No. 30, Blake Specialty Co., Rock Island, Ill.; Nos. 36 and 37, H. Mueller Mfg. Co., Decatur, Ill.; No. 42, Acme Mfg. Co., Toledo, O.; No. 43, Imperial Brass Mfg. Co., Chicago. On the basement floor the following exhibit rooms have been sold to the concerns indicated: No. 1, Chicago Pump Co., Chicago; No. 2, New York Continental Jewell Filtration Co., New York City; No. 3, Spencer Heater Co., Scranton, Pa.; No. 4, L. J. Mueller Furnace Co., Milwaukee; No. 5, M. E. Herbert Heater Co., Chicago; No. 17, Thomas & Smith Co., Chicago; No. 18, Magee Furnace Co., Boston. There are still several good exhibit rooms open, but parties who desire such space will no doubt find it wise to make their reservations at once. All communications should be addressed to Paul Redieske, chairman, or Peter M. Munn, secretary of the Exhibit Committee, 718 Schiller Bldg., Chicago.

THE METAL MARKET

PIG IRON STAGNANT.

While it is impossible to tell whether the price of pig iron has reached bottom or not it is clearly evident that quotations are down to a figure where any further reductions would cause the blowing out of some furnaces. With the increased wages demanded and received by all classes of labor, the blast furnace men are likely to demand a higher scale. The decline in coke prices has, of course, had its effect on pig iron, but the strike of the bituminous coal miners may result in higher figures for coke. This in turn would have an effect on pig iron prices. It is known that some of the largest consumers of iron are feeling the market, but it is probable that they will await a decided trend to the market. The output of iron during March was large, amounting to 2,615,216 tons.

Prices are without change from last week, as follows: No. 2 Southern foundry, Birmingham, $12.50 to $13.00 No. 1 Virginia foundry, New York, $18.00 to $18.50. No. 2 X Northern foundry, New York, $17.75 to $18.00. No. 2 Northern foundry, Chicago, $18.00 to $18.50.

THE COPPER MARKET.

The figures compiled by the Copper Producers' Association were more unfavorable than was expected by the trade. The chief point of disappointment was the increase in production, amounting to over 7,000,000 lb. The output from American mines was almost up to the high record figures of August of last year amounting, as they did, to 120,067,467 lb. This caused an increase of over 16,000,000 lb., the largest increase since March of last year. The resignation of Col. Livermore from the association is a cause of regret among many in the trade for it was felt that he had done more to aid the cause of honest figures than any other one man. His retirement comes at a time when his moral support is sadly needed. There has been little or no business during the last week but copper could have been had for export at $13.00.

THE MARKET IN PIG LEAD.

Prices of outside interests are slightly firmer than last week and they are now demanding $4.42½ for spot lead. The American Smelting & Refining company continues to quote shipment lead at $4.50 per 100 lb. in 50-ton lots. Lead for May delivery is in relatively better demand than for delivery this month.

THE SPELTER MARKET.

The spelter market is quiet and without change, prime western being quoted at $5.60 to $5.65 New York, and $5.45 to $5.50 St. Louis. There is an excellent demand for special grades of spelter used by brass manufacturers.

THE PIG TIN SITUATION.

Following the publication of the favorable statistics last week favorable to higher prices, the quotations on tin have declined. This is the general course in the tin market. It always goes contrary to the statistical trend, that is for short times. To really secure a good grasp on the tin statistics one has to look over a larger period than a month, and this perhaps is the reason why so many times the market acts at variance with published figures. Prices have declined and late last week it was possible to secure 5-ton lots at a shade under $33. There is plenty of tin here, nearly 14 tons having arrived so far this month, and there are afloat for American ports 2,500 tons, practically all of which will make this month's delivery.

NEW YORK METAL MARKET, APRIL 13.

Copper, Prime lake	$13.50
Copper, Electrolytic	13.00
Lead	4.45
Spelter	5.70
Antimony, Cookson's	8.35
Straits Tin	32.85

NEW YORK OLD METAL MARKET, APRIL 13.

Dealers' buying prices are as follows:

Heavy Crucible Copper	$12.00 to $12.12½
Plumbers' cocks and faucets	9.00 to 9.25
Heavy brass	8.00 to 8.12½
Light brass	6.25 to 6.37½
Heavy lead	3.75 to 4.00
Tea lead	3.50 to 3.75
Solder joints	6.25 to 6.50

THE OLD IRON MARKET.

The buyers' syndicate, composed of the steel mills taking scrap, is not so strong as it was and some members have withdrawn. The demand for scrap is not especially marked.

Prices are as follows:

No. 1 yard wrought, long	$14.50 to $15.00
No. 1 yard wrought, short	14.00 to 14.50
Machinery, cast	14.00 to 14.50
Wrought pipes and tubes	13.50 to 14.00
Wrought turnings	10.50 to 11.00
Cast borings	9.00 to 9.50
Stove plate	11.00 to 11.50

NEWS FROM WISCONSIN.

The Business Men's Association of Prairie du Chien has appointed a committee to secure an expert engineer to prepare plans for a sewage disposal system.

Ferdinando W. Pripps has disposed of his plumbing business, 136 Oneida St., Milwaukee, to the Associated Heating and Plumbing company, and will give his entire time to the agency for the Ruud heater in Wisconsin, Illinois and Minnesota, with main offices in Chicago. Edward Pripps, his son, will have charge of the Milwaukee agency, located at 409 Broadway, and after June 1 will take the entire state as his territory. A. G. Kuehner, who has been connected with the Ruud interests in Sheboygan, is affiliated with the Milwaukee agency as city salesman.

The citizens of Black River Falls are looking for someone who can invent a practical street cuspidor. In the recent contest of selling Red Cross stamps for the aid of the Wisconsin Anti-Tuberculosis association this city was awarded the prize of a vacuum cleaning system, and at that time they declared that the streets of their city would be provided with cuspidors so as to prevent the unhealthful habit of spitting on the sidewalks. As yet no suitable cuspidor has been found and it is said that so long as no substitute is found that the people will continue to expectorate upon the walks. Here's a chance for some inventive genius to aid in the crusade against the white plague.

PACIFIC COAST LETTER

Now that the San Francisco building laws have been settled in a manner satisfactory to all concerned, building work in San Francisco is being pushed ahead at a rapid rate and plumbers are commencing to become very active again. There are now more plans for buildings in the hands of the local architects than has been the case during the past two years and a large number of contracts will be let within a short time. Since the ruling in regard to sub-contracting went into effect, the plumbing trade may be regarded as being on a much safer footing than formerly and jobs are being taken at a lower figure than they were a few months ago for the reason that payments are regarded as being more certain. Taken all in all, conditions here are very favorable and a heavy volume of business is anticipated for the spring and summer months.

The Turner Co., San Francisco, has just been granted the contract for installing the plumbing, gas-fitting, sewer-work, steam-heating radiators, hot-water system, boilers and fixtures in a 3-story apartment-house building, being constructed by Jacob F. Deininger on Pine street, near Hyde. The consideration is $5,298.

Gainford, Lettich & Co., San Francisco, have secured the plumbing work in the building being erected by the Coliseum Amusement Co., at Fell and Baker streets. This work is to cost $1,240.

The Pacific Fire Extinguisher Co., San Francisco, has been awarded the contract for installing the heating apparatus in the 6-story building being erected by the William Ede Co. on Market street, near Seventh.

The heating contract for apparatus in the building being erected for the Mainwell Realty Co., at Market and Main streets, San Francisco, has been awarded to J. E. O'Mara for $1,040.

Frank J. Klimm, San Francisco, has been awarded the plumbing contract for the work in the building being erected for Thompson Bosler, on Bush street, near Jones, the consideration being $2,980. He also has the plumbing contract for the work on the O. D. Baldwin building to be erected at Harlan place and Grant avenue. The heating work in this structure will be done by the J. G. Sutton Co., San Francisco.

The annual meeting of the stockholders of W. W. Montague & Co. was held Monday, April 11th, at the offices of the company, 557 Market St.

The stock and exhibit of plumbing supplies in the store of the United Builders' Supply Co., Mission St., near Third, San Francisco, has been removed to the new establishment that has been set up by M. Levy on Polk St. Mr. Levy has secured several fair-sized contracts since opening in business in the new location

The Welte Sheet Metal Co., recently incorporated with a capital stock of $20,000 at San Diego, Cal., announces that it will do a plumbing as well as a sheet-metal business. Those interested in the company are John W. Welte, C. E. Welte and George P. Muchmore.

W. F. Creller, Pasadena, Cal., has just finished the erection of a fine 2-story brick building at that place which will be used as an office, shop and store building to accomodate his growing business.

The E. O. Nay Co., Pasadena, is also preparing to occupy a building of its own and expects to be able to move early this summer. A fine display-room will be one of the features of this store.

Whitney Bros., Santa Cruz, are preparing to move into a new store at that place. This firm carries a line of bath-room fixtures.

The Thomas Haverty Co., Los Angeles, has secured a number of fine contracts of late among which is one valued at $24,000 for the plumbing work in the new manual training school at that place. This is the largest contract let in that city for some time.

The Blumve & Jay Co., Los Angeles, has secured the steam-heating contract for the work in the building being erected by J. W. Hellman on West Fourth street. The contract is valued at $3,100. This contract also included the installation of a system of piping for vacuum cleaning. The plumbing work will be done by James W. Hellman for $4,949.50.

The Machinery & Electrical Co., Los Angeles, has been awarded the contract for installing the heating and ventilating apparatus in the new manual training school in that city, the consideration being $14,823.

J. Hokom, Los Angeles, has been awarded the contract for installing the plumbing in a new grammar-school building being erected there on Sixty-sixth street. The consideration is $1,968. The heating plant will be installed for $2,569 by the Machinery & Electrical Co.

Guercio Bros., Los Angeles, have been awarded the contract for installing the plumbing system in the residence being erected on Wilshire boulevard by J. P. Burns. This work is to cost $1,196.

A new plumbing shop is to be started up at Palms, Cal., by J. S. Farnsworth.

The plumbers at Bakersfield are reported to be out still on a strike but it is anticipated that the trouble there will be settled without difficulty as it is not one of wages or hours but a purely local question.

The building formerly occupied by Crane Co., San Francisco, is being torn down and the large stock of pipe stored there is being removed to the big worehouse at Second and Brannan streets.

The reservation of accomodations on the part of the San Francisco master plumbers for the convention trip to Yosemite Valley indicates that there will be a record attendance when the meeting is called to order next month.

W. S. Snook & Son, 602 Clay St., San Francisco, has been awarded the contract for the installation of the plumbing establishment at 910 Fannin street, in that city, being erected for J. S. Hutchinson, on Presidido terrace. Consideration, $1,270. Architects Bakewell & Brown, 417 Montgomery St., prepared the plans.

J. Hokom, 4312 Moneta Ave., Los Angeles, Cal., has been awarded the contract for the installation of the plumbing system in the new grammar school at 66th street. Consideration, $1,968. The Machinery & Electrical Co., Los Angeles, secured the contract for installing the heating system in that building at a consideration of $2,569.

NEWS FROM PENNSYLVANIA.

Ira A. Mann, 17 West Parkway, Pittsburgh, has been awarded the contract for the plumbing in the ten-story office building now being erected for the Watson Company at Fairmont, W. Va. The specifications call for a large number of high grade fixtures.

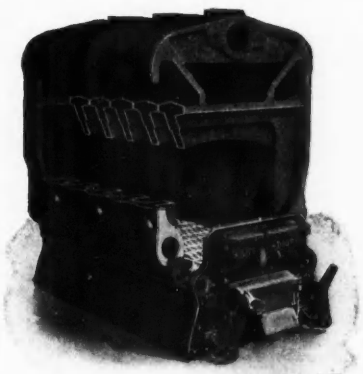
P. J. Koch, 32 Ormond Ave., Sharon, Pa., has been awarded the followng contracts during the last ten days: Plumbing and heating in Joseph Fleck's and George Ebenhoe's new residences; plumbing in six houses for Mead Long and in Atwood's new business block; steam-heating in the city hall at South Sharon.

The Modern Plumbing & Construction Co., North East, Pa., has been incorporated with a capital stock of $10,000. H. E. Plubell has been elected treasurer of the new company.

Announcement is made that the heating specifications for the new and mammoth club house of the Pittsburgh Athletic Association are being revised. The heating work in this improvement is being done under the direction of P. F. Maginn & Co., 1025 Forbes St., Pittsburgh, Pa.

Surface Values

No good agriculturist reckons crop possibilities by the number of farm acres----swamp, meadow and woodland. He bases his estimate on the character of the land. So, there is no greater mistake than that of basing the power of a house-heating boiler on the quantity of its heating surface, irrespective of position.



Boiler heating surface is desirable; but the direct surface, that is, surface nearest the fire, is worth from four to twenty-six times as much per square foot as indirect or flue area—in proportion as it is remote from the fire. That is one reason IDEAL Boilers give satisfaction; they are so proportioned as to present the largest percentage of their heating surface directly to the fire.

AMERICAN RADIATORS & IDEAL BOILERS

A Heating Outfit is More Efficient with NORWALL and SYLPHON SPECIALTIES

AMERICAN RADIATOR COMPANY

General Offices, 282-286 Michigan Ave., Chicago.

New York	Cincinnati	Cleveland	Atlanta	Bradford, Ont.	Denver
Philadelphia	Boston	Milwaukee	Minneapolis	Seattle	St. Louis
Pittsburg	Buffalo	Indianapolis	Kansas City	Omaha	San Francisco
Washington					

Kindly quote "Domestic Engineering" in writing advertisers.

OHIO PLUMBING INSPECTION BILL PASSES HOUSE.

House bill No. 393, introduced by Clifford T. Schlemmer, passed the Ohio House of Representatives on Tuesday, April 12, creating the office of State Inspector of Plumbing, defining the duties of the office, fixing the compensation of the incumbent thereof, and fixing a penalty for the violation of any of the provisions of the act. The bill in its entirety follows herewith:

Section 1. There shall be, and is hereby, established and created in this state the office of state inspector of plumbing, under the direction and supervision of state board of health.

Section 2. It shall be the duty of the state board of health, within ninety days after the passage and approval of this act, to appoint an elector of this state to fill the office of state inspector of plumbing, and to hold office until such a time as his successor may be appointed and qualified. The person so appointed must be a plumber with at least ten years' experience. The state board of health shall have the power to make and enforce rules and regulations governing plumbing to carry out the provisions of this act.

Section 3. It shall be the duty of said inspector of plumbing, as often as instructed by the state board of health, to inspect any and all public or private institutions, sanitariums, hospitals, schools, prisons, factories, workshops, or places where men, women or children are or might be employed and to condemn any and all unsanitary or defective plumbing that may be found in connection therewith, and to order such changes in the method of construction of the drainage and ventilation, as well as the arrangement of the plumbing appliances, as may be necessary to insure the safety of the public health.

Section 4. He shall hold himself in readiness at any and all times to go to any part of the state if so directed by the state board of health, for the purpose of making a sanitary inspection of any building or other place that they have reason to believe is in such a condition as to be a menace to the public health.

Section 5. When any building is found to be in a sanitary condition or when changes which are ordered in the plumbing, drainage or ventilation have been made, and after a thorough inspection on approval by said inspector of plumbing, he shall issue a certificate signed by himself and countersigned by the state board of health, which must be posted in a conspicuous place for the benefit of the public at large. Upon notification by said inspector, said certificate shall be revoked for any violation of this act.

Section 6. For each inspection and certificate so issued, except on inspections of state buildings or structures, he shall charge a fee of five dollars, such fee to be turned into the state treasury. If upon first inspection such work is found in sanitary condition, no charge is to be made for such inspection or certificate.

Section 7. Within ten days after his appointment the said inspector shall give a bond, payable to the state of Ohio, for the faithful performance of his duties in the sum of five thousand dollars. Said bond, when approved by the attorney-general, shall be deposited with the auditor of state.

Section 8. The inspector so appointed shall not, during his term of office, be engaged or interested in the plumbing business or the sale of any plumbing supplies, nor shall he act as agent, directly or indirectly, for any person or persons so engaged.

Section 9. He shall receive for his services a salary of two thousand five hundred dollars per annum, payable monthly and all necessary expenses.

Section 10. He shall have the power between sunrise and sunset to enter any public building where he has good and sufficient reason to believe that the sanitary condition of such premises is such as to endanger the public health, for the purpose of making such inspection as may be necessary to ascertain the condition of the same.

Section 11. He shall report promptly to the state board of health the condition of all premises inspected by him; also the number of inspections and changes ordered, as well as any other information with his office, that they may require.

Section 12. He shall be provided with a suitable office in the city of Columbus, as well as with all necessary apparatus for making tests, and such stationery as the business of his office may require.

Section 13. It shall be the duty of any owner, agent or manager, of any public building where an inspection is ordered by said inspector of plumbing to cause or have the entire system of drainage and ventilation repaired, as he may direct. After due notice to repair such work, it shall be the duty of said owner, agent or manager to notify said inspector of plumbing that such work is ready for his inspection. Failing to have work ready for inspection at specified time of such notice, he will be subject to such penalty as is hereinafter provided.

Section 14. Any person or persons, owner, agent or manager refusing, failing or neglecting to comply with any of the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction shall be subject to a fine of not less than ten nor more than one hundred dollars, or imprisoned for not less than ten nor more than ninety days or both; but no person shall be imprisoned under this section for the first offense, and the prosecution shall always be as and for a first offense, unless the affidavit upon which the prosecution is instituted contains the allegation that the offense is a second or repeated offense.

Section 15. It shall be the duty of said inspector of plumbing upon receipt of the knowledge that any part of this act has been violated to go before any justice of the peace and cause the arrest and prosecution of all persons of whom he has reason to believe are guilty of such violation.

OBITUARY.

James F. Ryan, president of the Byrne & Ryan Plumbing Co., Chicago, vice-president of the Kokomo Brass Works, the Byrne-Kingston Co., and the Kokomo Electric Co., Kokomo, Ind., died at his home in Chicago on March 26th, in his 51st year. He was born in Chicago and served his apprenticeship at the plumbing trade with Sanders & Bro. In 1888 he formed a partnership with Chas. T. Byrne and opened a plumbing establishment on Cottage Grove Ave., Chicago. This partnership proved very successful and lasted till his death. Mr. Ryan's character and disposition endeared him to all who came in contact with him, and to his many friends his death is a distinct loss. He had been in poor health for nearly three years and his death was caused by kidney trouble and heart disease. He was buried at Mount Olivet cemetery and the funeral was well attended by members of the Chicago Master Plumbers' Association, among them: J. E. Baggot, C. J. Boyd, Thos. Conlin, R. B. Finn, John Degnan, C. J. Herbert, D. J. Hickey, C. P. Hulbert, M. L. Mandable, P. M. Murphy, P. Nacey, Jos. Reilly, J. H. Roche, P. Sanders, C. T. Byrne, A. E. Mortimer, who served as honorary pall bearers. The active pall bearers were M. L. Mandable, H. W. Johnson, P. M. Murphy, Edward Sanders, Andrew Bracken and M. J. Cragin. The supply men in attendance were Hugh Whitney, of Whitney & Ford; M. T. Whitney, of H. Mueller Mfg. Co.; Wm. Doyle, of the Illinois Malleable Iron Co., and Thos. Brothers, of Crane Co. Mr. Ryan leaves a wife and five children, the oldest aged 18 years, and the youngest four years.

George Cooper, who has been engaged in the plumbing business at Springfield, Mo., for a number of years, died Friday night, April 8, at his birthplace in Leicester, England, according to a cablegram to his family in Springfield. Mr. Cooper's death followed a brief illness of pneumonia while he was on a visit to his birthplace. George Cooper was in his 46th year at the time of his death, and he came with his father and his brother, Harry Cooper, to Springfield, Mo., 36 years ago. The two brothers engaged in the plumbing business at Springfield about 20 years ago conducting it under the name of Cooper Bros., until about two years ago when George Cooper sold his interest in the business to his brother. He is survived by his wife, two daughters, his brother and his father.

Eugene F. Osborne, a well-known heating engineer, died at his home in Chicago on Thursday, April 7th, in his 64th year. He was the designer of the cold-storage building at the World's Fair in Chicago, and he did important experimental work along the line of equalized heating systems.

NEW BUSINESS VENTURES.

The Model Plumbing & Heating Co., Sikeston, Mo., has been incorporated with a capital of $3,000. Incorporators: H. C. Maio, Dr. H. L. Smith and C. R. Hamilton.

C. A. Powell, St. Joseph, Mo., has opened a branch of his plumbing establishment at 121 South Main St., Blackwell, Okla.

Grambs & Peet is the style of a new plumbing firm which has just started in business at Miles City, N. D.

The Foster-Smith Co., Norfolk, Va., has been incorporated with a capital of $25,000 to conduct a plumbing and heating business. The officers of the new company are: President, F. P. Smith; vice-president, S. L. Foster; secretary, J. P. Williams.

The Gesling-Gordon Company has opened a new plumbing and heating business at 109 South Columbus St., Lancaster, O. The new company would like to receive catalogs from jobbers and manufacturers of plumbing and heating supplies.

B. Windidte, formerly of Minneapolis, Minn., will soon open a heating establishment at 826 Eighth St. N., Manitowoc, Wis.

The Western Heating, Plumbing & Construction Co., Aberdeen, Wash., has been incorporated with a capital of $25,000. The incorporators are: C. L. Peterson, C. A. Pinckney, and Curtis Mann.

GOOD BOOKS TO READ.

Did you ever get lost in a forest? It is a difficult thing to orient oneself when surrounded by trees whose tops shut out the sky, and the knee-deep grass, rush and brush conceal from the eye the slightest indication of a path which may lead you to somewhere. It is difficult sometimes for the experienced woodsman with his natural instinct to extricate himself successfully from such a position. To the one who is unaccustomed to wood and forest life, the maze has no solution, and starvation and death have often terminated days of struggling to find an exit.

Many a merchant today, roused by competition, realizes the necessity of straightening out his accounts so as to orient himself and ascertain his actual financial standing. He has let things go up to this, running his business in a hit-or-miss way, and taking for granted that there would always be money at the bottom of the bag when it was needed. When he wakes to his folly and undertakes to trace his way out of his difficulties he finds himself surrounded by a forest of figures whose values and appearance are as meaningless to him as are the trees in the eye of the uncultured lost one without the knowledge of woodcraft.

If any of our readers are in this position, and want to find a blazed trail to business freedom, it can be found by a careful reading and study of the "Cost Accounting Pathfinder." It is full of horse-sense, can be understood by the most unversed in bookkeeping matters, and will also be appreciated as a stimulant to good practice by those who do keep account of their business affairs along some definite legitimate lines. The cost of the "Pathfinder" is only 50 cents, postage prepaid, and it can be secured from the Midland Publishing Co., 810 Pine St., St. Louis, or from the book department of "Domestic Engineering," 325 Dearborn St., Chicago. To those who are not in favor of the prohibition movement it may be of interest to state that there is not a "dry" line in the book.

The Bishop & Babcock Co., Cleveland, O., is carrying out an aggressive campaign in its advocation of air-line installations as applied to all steam-heating systems, regardless of pressures carried. The company's literature on the subject points out the economic advantages of such equipment and the possibility of its application to any type of building. To obtain the highest efficiency, it should be connected with a vacuum pump, a special type of which has been constructed for the purpose by the company. E. Collins, representing this aggressive Cleveland organization in Chicago, states that the education of the consumer is broadening and his office notes a steady trend of opinion in favor of using air lines and steam pipes in tandem.

CAPITOL BOILERS AND RADIATORS

TEST—No. 4

(Showing the real value of Divided Sections.)

About a year ago we discovered a leak in one section of our Capitol Boiler. We immediately pulled the fire, allowing the boiler to cool and phoned for the plumber. He, with a few strong men to assist him, took the broken section out, plugged the two connections with well fitting wooden plugs, then placed the plugged sections to their original places and immediately started the fire again.

The time consumed in this work was between an hour and an hour and a half.

We ran this way until warm weather without any material change of heating the hotel, then replaced the new section.

We think the broken section was caused by the fireman letting the water get too low in the boiler and then letting in cold water before allowing the boiler to cool off.

(Name and Address on request.)

United States Heater Company.

General Offices and Works: Fort St. and Campbell Ave., DETROIT, MICH.

BRANCHES:			SALES AGENCIES:		
DETROIT	-	139 Jefferson Ave.	MINNEAPOLIS, MINN.,	-	Plumbing & S. F. Supplies Co.
NEW YORK	-	129 Worth St.	ST. LOUIS, MO.,	-	L. M. Rumsey Mfg. Co.
CHICAGO	-	34 Dearborn St.	DENVER, COLO.,	-	Kellogg & Stokes Stove Co.
OMAHA	-	916 Farnam St.	DULUTH, MINN.,	-	Duluth Plumbing Supplies Co.

Classified Advertisements

Advertisements under this heading 4 cents per word per issue, address included. Remittance to be made with order. To insure insertion copy should be received not later than Wednesday morning.

Situations Wanted

WANTED—POSITION AS SALESMAN for pipe, fittings and brass goods. Experienced and thoroughly posted. Address 273, "Domestic Engineering," Chicago.

WANTED—POSITION AS BUYER AND Sales Manager or Branch Manager in wholesale plumbing and heating supply line, by man now employed in similar position on the Pacific Coast. Prefer eastern city. Address No. 261, "Domestic Engineering," 325 Dearborn St., Chicago.

TRAVELING SALESMAN FOR HEATing and Power Plant Supplies is open for an engagement. Has had 15 years' experience. Knows the trade well—from Buffalo to Denver. Address 231, "Domestic Engineering," 325 Dearborn St., Chicago.

RADIATOR SALESMAN WITH AN EXtensive acquaintance in New York and vicinity would like to make a change this spring. A No. 1 references. Address 265, "Domestic Engineering," 325 Dearborn St., Chicago.

WANTED—A POSITION AS SOLICITOR and estimator with a heating contractor; 15 years' experience on heating work; or would take position as salesman for heating or plumbing goods; experience and extensive acquaintance with the trade in the East. Address No. 266, "Domestic Engineering," 325 Dearborn St., Chicago.

TRAVELING SALESMAN, WHO HAS covered the Pacific Coast for a manufacturer of plumbers' brass goods for several years, would like to make a change May 1. Has a large acquaintance. Address 268, "Domestic Engineering," 325 Dearborn St., Chicago.

SITUATION WANTED—STEADY EMployment by first-class steamfitter. Can design and estimate. No boozer. Best of references. Address, stating wages, No. 267, "Domestic Engineering," 325 Dearborn St., Chicago.

WANTED—POSITION WANTED BY good reliable plumber; can estimate plumbing and heating; has experience in mechanical drawing and laying out of work; sober, industrious; can make good anywhere. Address No. 306, "Domestic Engineering," Chicago.

Help Wanted.

WANTED—A FIRST-CLASS PLUMBER. Address William Bokenkamp, 223 W. 2nd St., Muscatine, Iowa.

WANTED—A FIRST-CLASS PLUMBER and steamfitter; steady work and a good job for the right man. Address E. S. Roe, Buchanan, Mich.

WANTED—Capable man for plumbing and heating; steady work; must deliver the goods. Boozers fired. K. D. Horrall Hardware Co., Lawrenceville, Ill.

WANTED—Salesmen to sell our "Acme Water Heaters" as a side line. Heaters are fast sellers and good repeaters. Write for territory. Acme Mfg. Co., Toledo, O.

WANTED—BY A PROMINENT MANUfacturer of Plumbing Fixtures, a representative for New Mexico and Arizona, who is familiar with the trade; preferably as a side line and on commission basis. Address No. 269, "Domestic Engineering," 325 Dearborn St., Chicago.

WANTED—A FIRST-CLASS FOREMAN for old-established Plumbing and Heating business. Must be thoroughly capable, reliable, a hustler, and able to accurately estimate work. A splendid opportunity for right party. Address No. 300, "Domestic Engineering," 325 Dearborn St., Chicago.

WANTED—TWO CAST-IRON BOILER salesmen, one for the Pacific coast and one for the middle west. Only those thoroughly acquainted with the trade need apply. Address No. 302, "Domestic Engineering," Chicago.

WANTED — Manufacturer of Sanitary Goods, extending his business desires salesman and manager of branch office; investment required; no dead ones wanted. Address No. 272, Domestic Engineering, Chicago.

WANTED—A TRAVELER ACQUAINTED with the architects' and retail plumbing trade in the Central States. Must have good acquaintance and full knowledge of closet fixtures and other specialties in connection with plumbing supplies. Give references and salary expected. Address No. 301, "Domestic Engineering," 325 Dearborn St., Chicago.

For Sale

FOR SALE—COMPLETE PLUMBING and heating library. Write for list of books. Address: 229, "Domestic Engineering," 323-325 Dearborn St., Chicago.

FOR SALE—GOOD PLUMBING BUSIness in good town; sewers just going in; good reasons for selling. Address No. 262, "Domestic Engineering," 325 Dearborn St., Chicago.

FOR SALE IN NEW YORK CITY—Hand-power pipe threading machine, as good as new, capacity from 1 to 4 in. Address No. 230, "Domestic Engineering," 325 Dearborn St., Chicago.

FOR SALE—FINE PLUMBING AND heating business in northern Michigan city of 15,000 inhabitants. Good reason for selling. Address No. 264, "Domestic Engineering," 325 Dearborn St., Chicago.

FOR SALE—FIRST-CLASS PLUMBING and heating business in Indiana town with a population of 15,000. Good opportunity for the right man. Address No. 234, "Domestic Engineering," 325 Dearborn St., Chicago.

FOR SALE—PLUMBING AND TINNING business in Ohio town of 7,000; good location; established 20 years; good clean stock; will invoice about $2,500; reason for selling old age. Address No. 260, "Domestic Engineering," 325 Dearborn St., Chicago.

FOR SALE—WISHING TO RETIRE, will sell patented vacuum-heating system, either United States and Canada or State rights. Over four hundred successful plants in operation. Address No. 256, "Domestic Engineering," Chicago.

FOR SALE — SECOND-HAND PIPEthreading and cutting machine, up to 6 ins. inclusive. Address No. 305, "Domestic Engineering," Chicago.

FOR SALE—PLUMBING AND HEATing business in a California town of 10,000. Parties wish to retire on account of other business. Address No. 304, "Domestic Engineering," Chicago.

FOR SALE—PLUMBING AND HEATing business, established 15 years ago, city of 20,000 in central Iowa; will sell cheap; reason for sale other business requiring full attention. Address No. 237 "Domestic Engineering," 325 Dearborn St., Chicago.

Plumbing Schools

LEARN PLUMBING ON NEW BUILDings in four months. Tools furnished. Master Plumbers' Trade School, 3659 Finney Ave., St. Louis, Mo.

PERSONAL.

Chas. H. Denison.

Consulting Practical Specialist. Low-Pressure Steam and Hot-Water Heating, Gas, Plumbing. Advice on Business Affairs. Address: 2730 Wilcox Ave., Chicago.

WE PUBLISH:

AIR VALVES FOR STEAM HEATING SYSTEMS. This book tells how, why and where air valves should be used. 5x7½ in.; 39 pp. Postpaid, 25 cents.

A COMPLETE GUIDE TO TESTING PLUMBING. A full treatise showing the necessity of testing new and old work; methods of testing fully described; 7½x5¼ in.; seventeen illustrations. Postpaid, 25 cents.

DEAN'S SYSTEM OF GREENHOUSE HEATING by steam or hot water; used for years; convenient and reliable; makes greenhouse heating estimating very simple. Flexible cloth bound, 5½x7¾ in., 46 pp. Postpaid, $2.00.

MAKING THE BUSINESS PAY. Letters of John Burton, retired successful plumber and steamfitter, to his nephew still in business. Practical, instructive, entertaining, a guide to better business. Cloth bound, 5½x7¾ in.; 168 pp. Postpaid, $1.00.

SWIMMING POOLS. Their construction; cold and hot water supply; various methods of heating the water; directions as to selecting correct sizes of heaters. A practical guide to the subject. Over thirty illustrations; 6¼x4¼ inches. Postpaid, 50 cents.

SIZE OF FLOW AND RETURN STEAM MAINS. Contributions from thirty heating engineers of different cities in United States, giving current practice; full of practical advice and useful tables. Bound in boards, 6¼x4¼ in., 104 pp. Postpaid, 50 cents.

TABLES FOR CALCULATING SIZES OF STEAM PIPES. These tables furnish a method of determining sizes of steam pipes for low pressure heating without laborious mathematical calculations. Bound in cloth; 4½x6⅞ in.; 47 pp. Postpaid, $2.00.

DEAN'S STEAM FITTER'S COMPUTATION BOOK. Tables for finding cubical contents of rooms and radiation required, also general information on points of interest to steam and hot water fitters. Flexible cloth bound, 5x7½ in., 90 pp. Postpaid, $2.50.

SANITATION IN THE MODERN HOME. An invaluable guide to the architect, plumber, heating engineer and house owner, telling just what is necessary to make a home completely sanitary from the subsoil to the roof. 8x5¼ in.; 272 pp.; bound in cloth. Postpaid, $2.00.

SANITARY SEWERAGE OF BUILDINGS. An authoritative statement of the principles and practice of sewering buildings, including the design and construction of plumbing systems, disposal of sewage in unsewered localities, etc. 8x5 in.; bound in cloth; 209 pp. Postpaid, $1.50.

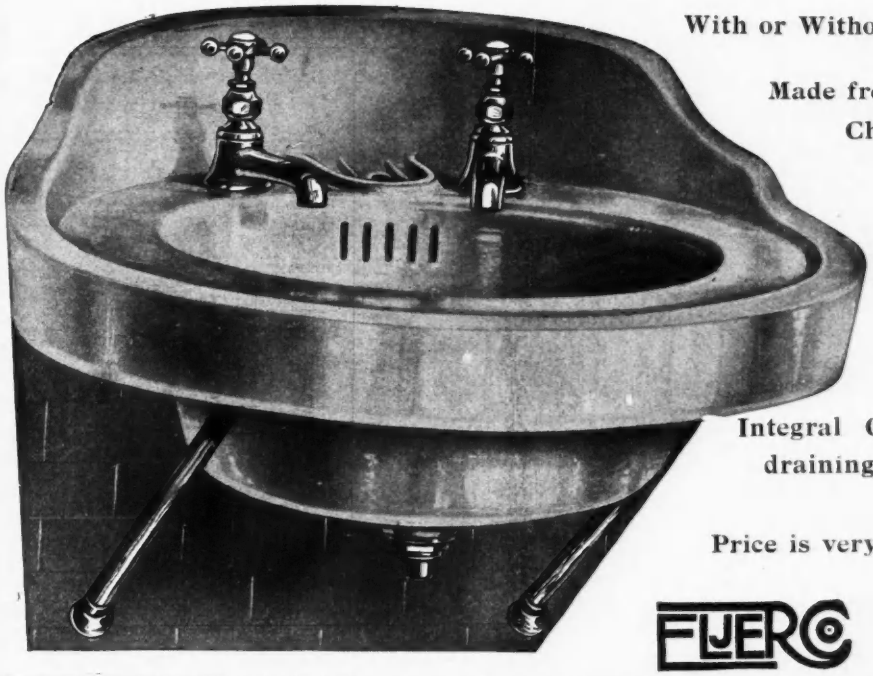
ROUGHING-IN HOUSE DRAINS. A complete guide to the work of roughing-in plumbing, from the digging of the sewer to the finishing length of the soil and vent stacks, giving each step to be taken and telling how and why it is done. 6¼x4¼ in.; 184 pp.; bound in boards. Postpaid, 50 cents.

PLUMBING CATECHISM. Second edition. This book formulates, in question and answer form, the basic principles of plumbing design and practice. It is therefore especially commended to students in engineering and trade schools, and to master and journeymen plumbers, preparing for examinations. Bound in cloth, 6¾x4¾ in.; 125 pp. Postpaid, $1.00.

NOTES ON HEATING AND VENTILATION. Second edition. This book is a resume of lectures delivered to classes in heating and ventilation at the University of Michigan. It is written primarily for the steamfitter and designer of heating systems. Reduced to as brief a form as possible, so that readers can readily find notes or data desired. Bound in cloth, 6¾x4¾ inches; 272 pp.; postpaid, $2.00.

Address—
DOMESTIC ENGINEERING,
323-325 Dearborn St., Chicago.

"ELJER" VITREOUS CHINA "CIRCLE" LAVATORY



With or Without Back

Made from Best Vitreous China, in Beautiful Designs

Easiest Lavatory to install

Integral China Soap Cup draining into Overflow

Price is very reasonable

ELJER CO. CAMERON, W. VA.

RACK LABELS

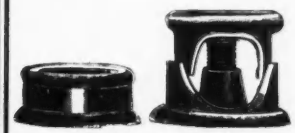
SHOWS WHAT YOU WANT AT A GLANCE

Applied to shelves, racks or drawers, enables you to find the right article without delay. Not only names but illustrates each article. Makes stock taking easy. Saves time and money. Printed in plain, readable type.

WRITE FOR PRICES

MERCANTILE LABEL CO., Nashua, N. H.

ADJUSTABLE RADIATOR FOOT REST



Patented Dec. 8, 1908

The time saved on each job pays for them —can be used for bath tubs and other fixtures.

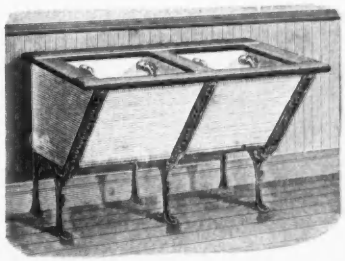
The Jennison Company Fitchburg, Mass.

SOLD BY JOBBERS

HIGHLY GLAZED SOLID PORCELAIN LAUNDRY FIXTURES

IMPERVIOUS — NON-PERISHABLE

SANITARY IN THE HIGHEST DEGREE



NOT HOW CHEAP, BUT HOW GOOD

Superior in Design, Material and Construction

CHEAP BECAUSE THEY LAST LONGER

SEND FOR OUR CATALOG

Charles Graham Chemical Pottery Works

986-1018 Metropolitan Avenue, BROOKLYN, N. Y.

INDEX TO ADVERTISEMENTS

NOTICE TO ADVERTISERS: **Copy and cuts for advertisements intended for a particular issue should reach the office of Domestic Engineering on Monday of the previous week if it is desired that a proof of the advertisement shall be submitted. New advertisements can be received up to noon of Monday of the week of issue, but no proof can be shown.**

The Star (*) indicates that the advertisement is inserted every other week, the dagger (†) once a month.

A

Abingdon Seat & Tank Mfg. Co..... 70
*Acme Mfg. Co. ..... —
*American District Steam Co..... 2
American Machine Co. ..... —
American Radiator Co..... 55
American Supply & Manufacturers' Association ..... —
*Anchor Stone Co. ..... —
Anderson McCutcheon Co. ..... —
Armstrong Mfg. Co. 3
*Atlantic Filter Co. 72
Auburn Leather Goods Co. ..... Inside back cover
Ayling & Reichert Co.....Back cover

B

Badger & Sons Co., E. B..... 78
*Bailey & Company, F. T.....Back cover
Barrett Mfg. Co., The Jas..... 80
Bay State Brass Co....Inside back cover
Beardslee Chandelier Mfg. Co..... 80
Beaton & Corbin Mfg. Co..... 15
Becker Mill Co. 80
Belknap Mfg. Co. 3
*Berger Mfg. Co., B. A.Inside front cover
*Bignall & Keeler Mfg. Co..... —
Bishop & Babcock Co. 16
*Blake Specialty Co..... 14
Bogardus & Co., Henry A. ..... Inside front cover
Borden Co. 9
Boston Brass Co. 64
Boynton Furnace Co..... 6
Braender, Phillip 9
Brock Wrench Co..... 7
Buckeye Pump Mfg. Co.Inside front cover
†Buffalo Meter Co. ..... —
Buffum Tool Co. ..... —
*Burlington Brass Works ..... —

C

Cahill Iron Works 77
Cambridge Plumbing Supply Co..... 73
Camden Pottery Co. 68
Cameron-Schroth-Cameron Co. ..... —
*Campbell Mfg. Co. ..... —
Canfield Co., H. O. 80
Capitol Brass Works 10
Case & Son Mfg. Co., W. A..... 7
*Champion Safety Lock Co. ..... Inside back cover
Chesapeake Supply Co. 19
Clayton & Lambert Mfg. Co. ..... Inside back cover
Columbia Heater Co. ..... —
Consolidated Engineering Co..... Front cover and 61
Cornell & Underhill...Inside front cover
Crosby Steam Gage & Valve Co.... ..... Front cover
†Cudell, F. E. ..... —
Curtis & Curtis Co. 4

D

†Darling Co., O. J..... —
Davis, Louis N. 19
Dayton Supply Co..... 65
Deming Co., The.....Back cover
Denslow Heating Co.....Back cover
*Detroit Lubricator Co..... 3
Detroit Sanitary Supply Co...Back cover
Dixon Crucible Co., Joseph..... 64

E

Economy Gas Machine Co....Back cover
Edmond, Louis ..... —
Electric Heat Regulator Co..... —
Eichman Mfg. Co., J. C..... —
Eljer Co. 59
Empire Hotel 64
Enameled Tank Co..... 66
*Estabrook's Sons, R...Inside front cover
Eureka Valve Co..... 80
Exeter Brass Works..... 73

F

*Felz, Alexander ..... —
*Findeisen & Kropf Mfg. Co..... 76
Flagg & Co., Stanley G..... 7
Fleck Bros. Co..... 74
Ford & Donnelly..... —
†Foster Engineering Co..... —
†Franklin Pipe & Foundry Co..... —

G.

Galard Co., The..... —
*Gerstein Bros. & Copper..... —
Glauber Brass Mfg. Co..... —
Globe Heat-Power Co..... 12
*Graham Chem. Potteries Works, Chas. 59
*Great Western Pottery Co..... —
Gurney Heater Mfg. Co..... 1

H

*Haas Co., Philip..... —
†Hart Mfg. Co. ..... —
Harvey's Sons Mfg. Co., A., ... 9
*Hayes Mfg. Co..... —
Hays Mfg. Co.....Inside back cover
Hawkins Pump Works..... —
*Homestead Valve Mfg. Co. ..... Inside front cover
Honeywell Heating Specialty Co..... —
Hughson Steam Specialty Co..... 22
*Humphrey Co. 15
Humphryes Mfg. Co..... 68
*Hunsberger, Daniel ..... —

I

I. X. L. Pump & Mfg. Co..... 79
Ideal Heating Co..... —
*Ideal Supply Co..... —
Illinois Electrotype Co. 66
Illinois Malleable Iron Co..... —
†International Heater Co..... —
*International Correspondence Schools. 18
Iron City Sanitary Mfg. Co..... 13

J

†Jarecki Mfg. Co..... —
†Jenkins Bros. .....Front cover
Jennison Co. 59
†Jewell Mfg. Co..... —
*Johns-Manville Co., H. W..... —
Judd, Inc., E. C. B..... 63

K

Kellogg-Mackay Co. 21
*Kemp Mfg. Co., C. M..... —
†Kenney Co., J. C..... —
*Kennedy Valve Mfg. Co..... —
Kewanee Boiler Co. 11
Kewanee Water Supply Co..... —
*Kinsey & Mahler Co..... 3
Kohler Sons Co., J. M..... 77
*Kroeschell Bros. Co..... 4

L

*Lavigne Mfg. Co..... 8
*Lawson Mfg. Co..... —
Loew Mfg. Co..... 4
Lord & Burnham Co..... 15
Lowenhaupt, Walter J..... 66

M

Maddock's Sons Co., Thos..... 79
McCormick Mfg. Co..... 65
*McCrum-Howell Co. ..... —
Mercantile Label Co..... 59
†Millar & Sons Co., Chas..... —
Milwaukee Heat Generator Co..... 5
Moline Vacuum-Vapor Heating Co... —
*Monash-Younker Co. ..... —
*Mott Iron Works, J. L..... 24
Mueller Mfg. Co., H. ..... Front cover and 71
†Murchey Machine & Tool Co..... —

N

*National Closet Mfg. Co..... —
*National Nipple Chuck Co..... —
National Steam Specialty Co..... 14
National Tube Co..... —
*National Vacuum Heating Co..... 14
†Naugatuck Mfg. Co..... —
Never-Split Seat Co..... 67
New England Plumbing Supply Co... 73
New York Central Iron Works Co.... —
†New York Leather Belting Co..... —
Norristown Magnesia & Asbestos Co. 12
Nye Tool & Machine Works..... 5

O

*Ohio Brass Co..... —
Oliver Typewriter Co..... 66
Osoeze Mfg. Co..... 22

P

Parker Co., Chas..... 19
*Peerless Selling Co..... 69
*Perkes, Chas., Estate of..... —
*Penna. Structural Slate Co..... —
*Penn Engineering Co..... 12
*Pfau Mfg. Co., The..... —
†Pittsburg Brass Mfg. Co..... —
*Pittsburg Gage & Supply Co..... —
Pittsburg Valve & Fittings Co..... 22
*Pittsburg Water Heater Co..... —
Powers Regulator Co..... 1
*Pressed Radiator Co. of America..... —
Prox Co., Frank 5
Prudential Heating Co..... 12
Pruitt, E. R..... 73

Q

Quincy Sanitary Mfg. Co..... —
*Quinn Mfg. Co. 65

R

*Raymond Lead Co.....Front cover
*Republic Mfg. Co..... 68
Rice, Edward J..... 73
Richardson & Boynton Co..... 63
Rose, J. A.....Back cover
Ross Valve Mfg. Co....Inside front cover
†Ryan & Co., J. J..... —
Ryan, E. J..... 8

S

†Sanitary Mfg. Co. ..... —
*Sanitary Pump Co., The..... —
*Saunders' Sons, D..... —
Schaum Engraving & Printing Co.. 18
*Scully Mfg. Co., W. J..... —
Shirley Radiator & Foundry Co..... —
*Siegrist, B. F..... —
Simmons Co., John..... 19
*Smith & Co., Jas. R..... —
Smith & Egge Mfg. Co..... 80
Smooth-On Mfg. Co..... 8
Southern Supply Co..... 64
Standard Sanitary Mfg. Co..... 75
*Star Expansion Bolt Co..... 19
Stearns & Co., F. M.....Back cover
Stebbins Mfg. Co., E., 72 and back cover
*Street & Kent Mfg. Co..... 78
Sturtevant Co., B. F..... 72

T

Threading Machine Co., The..... —
Toledo Pipe Threading Machine Co... 24
Trenton Brass & Machine Co..... 6
Trenton Potteries Co..... 20
Trimont Mfg. Co.....*..... 7
Tuller Hotel ..... —

U

†Union Foundry Co..... —
*Union Sanitary Mfg. Co..... 1
United States Heater Co..... 57
†United Tool Company..... —
†Utica Pipe Foundry Co..... —

V

†Vapor Heating Co..... 3

W

Walls, Owen & Stambach Co..... 18
*Walworth Mfg. Co..... —
*Watrous Co., The 17
*Weiskittel & Son Co., A..... —
*Wilks Mfg. Co. S..... —
Williamsport Radiator Co..... 10
*Wolff Mfg. Co., L..... —
Wolverine Brass Works..... 22
Wright Mfg. Co..... 63

Z

Zimmer, Phillip H.....Back cover

Kindly quote "Domestic Engineering" in writing advertisers.

IS A U. S. PATENT A JOKE OR A MONOPOLY (AS INTENDED BY THE GOVERNMENT)?

A patent is a joke to some people, but—the Seldon patent covering automobiles after being considered a joke for a number of years was finally sustained by the Court and then the joke was on the infringers—and how they did hollar.

After fondly thinking you had accumulated a little for the proverbial rainy day, wouldn't you hollar if you had to part with over **TWO MILLION DOLLARS,** which is the amount we understand the infringers have thus far paid in the Seldon cases?

Now we have four good, broad patents on the method by which the air and water from a radiator is forced into a float chamber of a return valve through a seal and the means for discharging the air, after it has passed the seal. These patents cover the principle **regardless of the construction of the valve.**

There are several concerns that are infringing these devices, **regardless of the broad patents which have been granted us,** and they are endeavoring to lead you to believe that, by reason of their superhuman vision, they can correctly anticipate the decision of the Court. They are offering to the trade devices which, by construction and name, are clearly infringements of our patents, and are distributing broadcast volumes of printed matter, and big lettered posters setting forth the fact that they are not afraid, etc., etc. Bravo! Good for them! Let us applaud their apparent bravery—**but, don't forget that you may be "holding the bag."**

We are continually asked the question, "Why don't you stop these people from infringing your patents?"

The only answer we can make is that a patent suit is unlike an ordinary law suit. When you bring the suit, the fact is published and the public know that the fight is on. The testimony is then taken, by both parties, in the private offices of the attorneys, before a United States Commissioner, and when all the testimony has been taken it is printed and bound up like so many books. Finally, this testimony is handed to the Court, who, after listening to oral arguments from the attorneys, takes the case under advisement, studies the patents, reads the mass of testimony presented and the briefs of the lawyers and renders his decision, in writing.

In addition to the time consumed in taking testimony (which is usually a year or more), the court may study the case for six months or more before rendering their decision. During all this time the public hears nothing and naturally assumes we are not active.

In the meantime, the infringing manufacturers continue trying to sell their wares usually by shifting the main burden of liability upon the purchaser. They talk big, throw out their chests and endeavor to make you think there is nothing to it, don't you know, etc.—**but wait!**

This is the unfortunate part of a patent suit—**you can only stop infringers after the Court has rendered a decision.** The mills of the United States Court grind slowly but they grind exceedingly fine.

Now a word to the wise should be sufficient and here it is—we have suits in the U. S. Courts against all parties who we believe are infringers, and these suits have been progressing for over a year and a half as rapidly as it is possible to push patent suits.

There will be no settlement of these suits out of Court.

The matter will be up to the Court in a short time for judgment. Our attorneys state that they have never seen a more unmistakable and clear case of infringement, and in their opinion the Court will decide that our patents are good and valid and infringed. Then where will the trusting contractors come in? We shall, of course, hold all parties to the infringement liable for damages, whether they be manufacturer, contractor, steamfitter or merely the user.

The issuance of a patent by the Government to any person is public notice of the fact that the Government has granted some one an exclusive monopoly, after which the burden is on the—user. All persons are liable for any action that infringes the rights of the monopoly granted.

When the Court holds these patents, or any one of them, to be valid, as our attorneys give us every assurance that they will, then the protection held out by the infringing manufacturers in the form of printer's ink, great (?) knowledge of patents, big talk, challenges and big posters, will disappear like so much chaff before the wind, and **nothing will then release you from your liability** but the payment to us of the damage sustained by the infringement. We shall exact from one and all alike the full measure of damages, "even to the last pound of flesh." You will then think we are the meanest concern on earth just because we shall insist on our just dues, when, as a matter of fact, this notice is being prompted to keep you out of trouble.

We have hundreds of friends in the trade, some of whom may be misled by improper statements made by infringing manufacturers who are doing their best to **make you "hold the bag" so far as liability is concerned.** If you want to use infringing valves in preference to ours, then make the manufacturers liable for the full load—in other words, **insist on a Surety Company's Indemnity Bond for the full amount of our claim,** which may be several times the cost of the infringing valves, and have this bond run for **six** years from the date of each purchase.

Keep in mind that if you accept the personal bond only of the infringing manufacturers, their entire assets might be wiped out four times over by their own increasing liability, in which event their bond to you might be found worthless. Insist on a Surety Company Bond and make it read to protect you against any and all claims of any patent, regardless of who owns the patent. Don't be influenced in accepting anything else.

If you do this, you will be, in a measure, safe when the judgment day comes. Take our advice, it costs you nothing—**take no chances unless you are amply secured.**

This is a heart to heart talk and we hope our friends will take it in the spirit in which it is written. If any doubt exists in your mind write us for further information. We will be only too glad to furnish copies of the patents and full information as to this legal battle up to date.

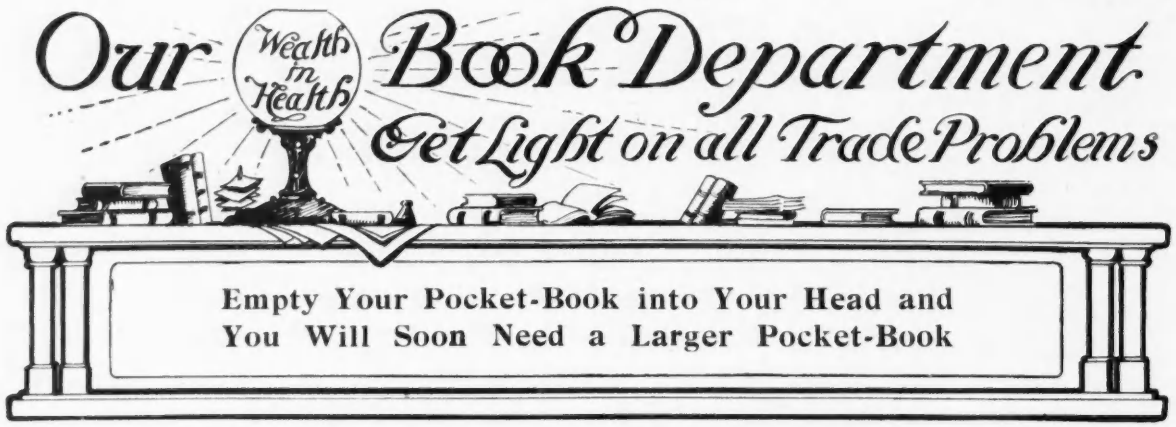
The patents mentioned above are:

Number 928153—Issued August 7th, 1906.
" 890555—Issued June 9th, 1908.
" 951751—Issued March 8th, 1910.
" 951752—Issued March 8th, 1910.

They are stamped on our Thermofier Valve, which is used in connection with—

THE VAN AUKEN SYSTEM OF VACUUM HEATING.

CONSOLIDATED ENGINEERING CO. Exclusive Licensees.
507 Jackson Blvd., Chicago.


Our Wealth in Health Book Department
Get Light on all Trade Problems
Empty Your Pocket-Book into Your Head and
You Will Soon Need a Larger Pocket-Book

Plumbing Catechism.

By C. B. Ball, Chief Sanitary Inspector, Chicago. Gives the basic principles of plumbing design and practice in question and answer form. Bound in cloth; 6¾x4¾ in.; 125 pages; postpaid, $1.

Roughing-In House Drains.

Edited by John K. Allen. A complete guide to roughing-in plumbing from the digging of the sewer to the finishing length of the house-drain. 88 illustrations; bound in boards; 6¼x4¼ in.; 184 pages; postpaid, 50 cents.

Notes on Heating and Ventilation.

By Prof. John R. Allen, University of Michigan. Valuable handbook for steam-fitters and designers of heating systems. Bound in cloth; 6¾x4¾ in.; 272 pages; postpaid, $2.

Swimming Pools.

By John K. Allen. Complete directions for construction and heating of swimming pools. Illustrated; postpaid, 50 cents.

The Sanitary Sewerage of Buildings.

By Thomas S. Ainge. Comprehensive discussion of the subject profusely illustrated. Bound in cloth; 222 pages; 5¾x8 in.; postpaid, $2.

Sanitation in the Modern Home.

By John K. Allen. Tells how to make a house sanitary from the sub-soil to the roof. Bound in cloth; 272 pages; 5¾x8 in.; postpaid, $2.

Sizes of Flow and Return Steam Mains.

By 30 leading heating engineers. Bound in boards; 6¼x4¼ in.; 96 pages; postpaid, 50 cents.

Dean's Steam-Fitter's Computation Book.

Tables for finding cubical contents of rooms and radiation required, also general information of interest to steam and hot-water fitters. Bound in flexible cloth; 5x7½ in.; 90 pages; postpaid, $2.50.

Hot Water for Domestic Use.

How to install the different apparatus and systems for this purpose. Brimful of practical advice. Bound in cloth; 4¼x6¼ in.; 128 pages; postpaid, 50 cents.

Tables for Calculating Sizes of Steam Pipes.

By Isaac Chaimovitsch. Containing method of determining sizes of steam pipes for low pressure heating systems without laborious mathematical calculations. Bound in cloth, 4½x6⅞ in.; 47 pages; postpaid, $2.

A Complete Guide to Testing Plumbing.

By John K. Allen. Gives methods of testing new and old work. 17 illustrations; 7½x5¼ in.; 36 pages; postpaid, 25 cents.

Dean's System of Greenhouse Heating by Steam or Hot-Water.

Makes greenhouse heating very simple. Bound in flexible cloth; 5½x7¾ in.; postpaid, $2.

Standard Heating Specifications and Contract Blanks.

For low pressure steam and hot-water heating apparatus offers a dignified legal form for specification proposal and contract for the general use of steam and hot-water fitters. Printed on linen paper; 14x8½ in.; 4 pages. Price for either steam or hot-water or mixed blank, 50 copies, $2.50.

Principles and Practice of Plumbing.

By J. J. Cosgrove. A complete handbook on this subject. Fully illustrated. Bound in cloth; postpaid, $3.

Sewage Purification and Disposal.

By J. J. Cosgrove. An exhaustive and reliable work on this vital subject. Fully illustrated. Bound in cloth; postpaid, $3.

History of Sanitation.

By J. J. Cosgrove. History of the plumber's craft from the time of the primitive man and up to our own day. 88 illustrations. Bound in cloth; postpaid, $1.50.

Wrought-Pipe Drainage Systems.

By J. J. Cosgrove. An invaluable aid to those who install iron pipe systems. Bound in cloth; 150 pages; 5¾x8½ in.; postpaid, $2.

Bookkeeping for the Plumber.

By George W. Ryan. Second Edition. A thorough and simple system of bookkeeping for the plumber. Contains much valuable information; fully illustrated. In paper cover; 58 pages; 5x8 in.; postpaid, 25 cents.

Questions and Answers on the Practice and Theory of Sanitary Plumbing.

By R. M. Starbuck. A practical up-to-date plumber's reference library, in two volumes. Volume 1 contains information on the practice and theory of plumbing, with a list of examination questions. Bound in cloth; 160 pages; postpaid, $1. Volume 2 covers the theory of range-boilers work, hot water supply and circulation. Bound in cloth; 160 pages; postpaid, $1.

Modern Plumbing Illustrated.

By R. M. Starbuck. A concise comprehensive, practical and up-to-date work covering the entire field of plumbing. Bound in cloth; 400 pages; 7¼x10¼ in.; 175 illustrations; postpaid, $4.

Practical Wrinkles for the Plumber.

By R. M. Starbuck. A collection of valuable and handy methods, devices and contrivances in plumbing. Bound in cloth; postpaid, $1.

Practical Hints on Joint Wiping.

A valuable book for beginners in plumbing, written by expert practical men. Bound in paper; 7¾x5½ in.; 66 pages; postpaid, 25 cents.

Heating and Ventilating Buildings.

By Prof. R. C. Carpenter, Cornell University. Describes the latest improvements in the art of heating and ventilation for the technical readers. Bound in cloth, 9¼x6 in.; 562 pages; postpaid, $4.

Kitchen-Boiler Connections.

Describes how to connect range boilers and water-backs under various conditions. Bound in cloth; 9¼x6 in.; 196 pages; 113 illustrations, postpaid, $1.

Air-Valves for Steam-Heating Systems.

By W. H. Wakeman. Tells how, why and where air valves should be used. 5¼x7½ in.; 39 pages; postpaid, 25 cents.

Making the Business Pay.

By John Burton. A retired successful plumber and steam-fitter's advice to men still in the business. Bound in cloth; 5½x7¾ in.; 168 pages; postpaid, $1.

Address: Book Department

Domestic Engineering, 323-325 Dearborn St., Chicago

VS13

A